

Scalable Web Programming

CS193S - Jan Jannink - 1/14/10

Administrative Stuff

- Updated programming assignment handout on web page
 - due by start of class next Thursday (Jan. 21)
- Work on & submit assignment #1 individually
- Review: testing expands a coder's reach
- Office space: Gates B28
- Website: <http://cs193s.stanford.edu>

Weekly Syllabus

1. Scalability: *(Jan.)*

2. Agile Practices

3. Ecology/Mashups*

4. Browser/Client

5. Data/Server: *(Feb.)*

6. Security/Privacy

7. Analytics*

8. Cloud/Map-Reduce

9. Publish APIs: *(Mar.)**

10. Future

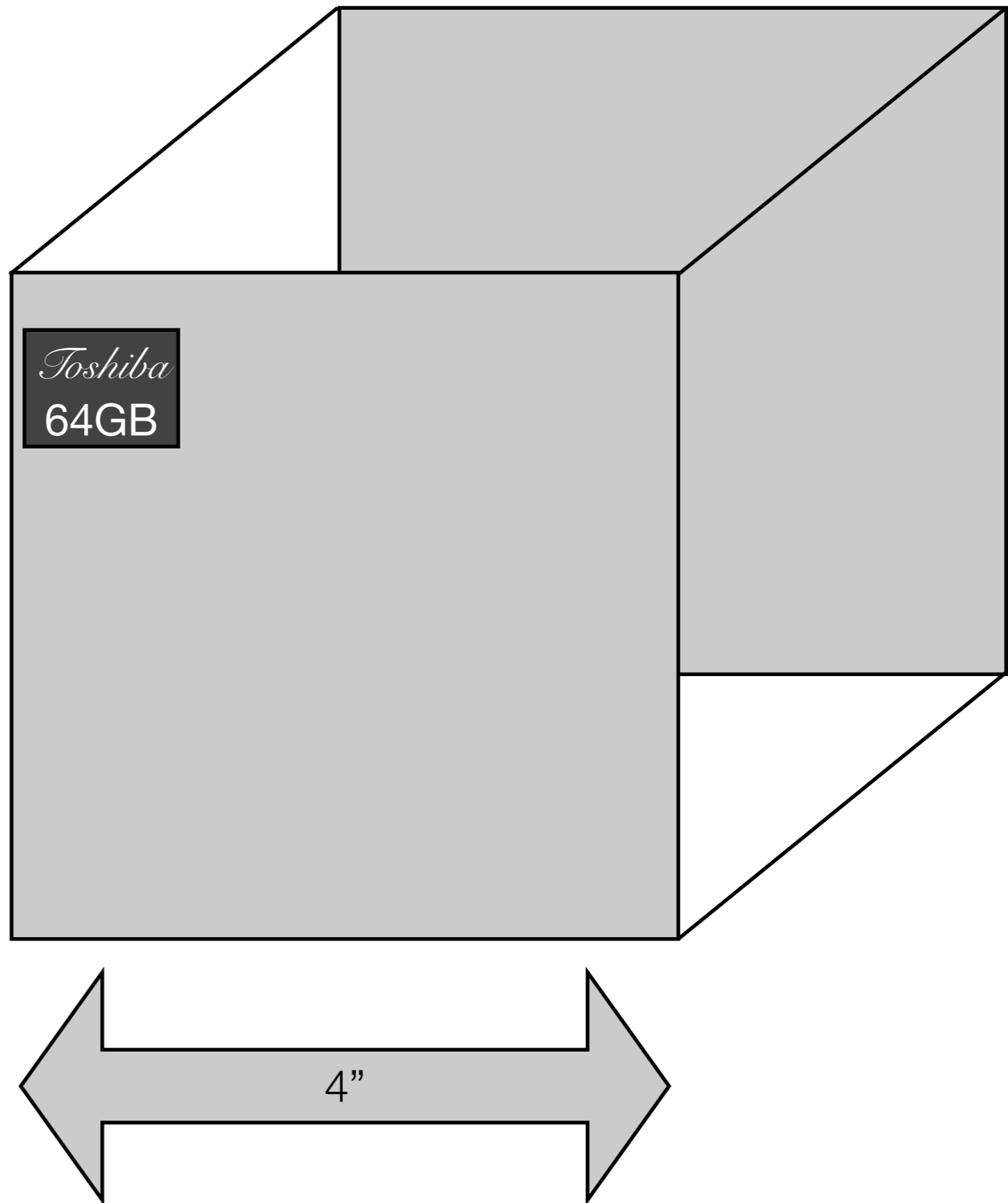
* assignment due

Programming Assignment #1 (follow up)

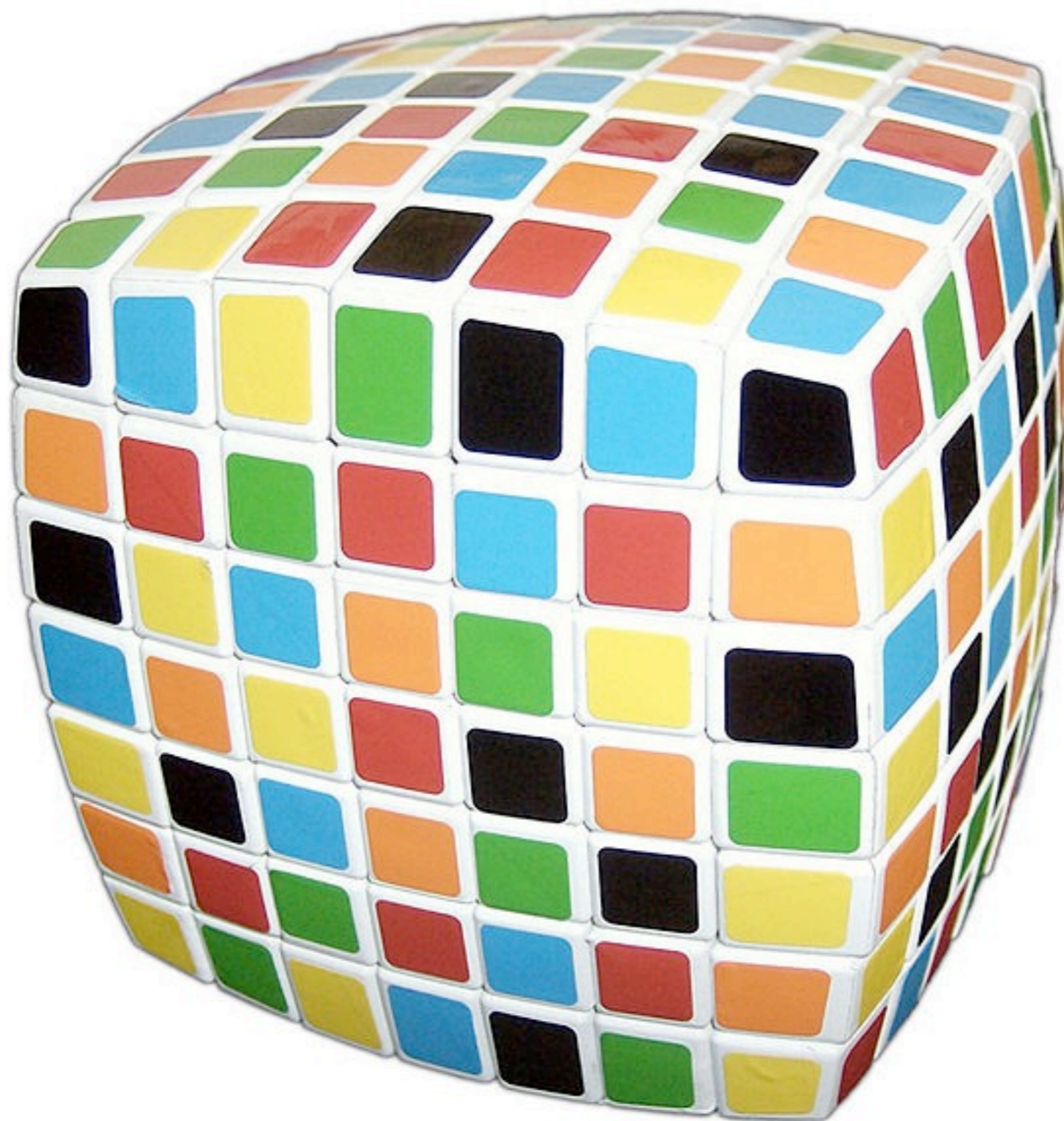
- Submit your work individually
 - will set up a git repository at: `/afs/ir/class/cs193s/`
- Use JUnit 3
 - GWT does not support JUnit 4 features yet
- Write 1-2 interesting paragraphs about your project interests
 - these serve as a pitch to your fellow students

A Data Trillionaire

- Toshiba just announced a tiny 64GB Flash module for 2010
- 2000 of these packages would fit in a 4" cube (10cm cube)
- Over 100 000 000 000 000 bits
- More than one for each dollar in the Zimbabwean bank note
- Although it would cost 6-7 figures in U.S. dollars!



$\sim 1.95 * 10^{160}$ Closing in on a Googol Googols



Other Notable Agile Tools

- Review: JUnit, Ant, Cruise Control
- Trac issue tracker
 - simplify communication with broader community
 - users, project managers, QA
- Nagios system monitoring
 - information gathering from the physical infrastructure
 - learn explicit modeling of distributed systems

Tools vs. Processes vs. Practices

- Tools matter only if you use them
 - expand reach & accuracy of your information (force multiplier)
- Processes sound slow by definition
 - something you struggle to start let alone complete
- It's what people accomplish that counts
 - efficient, effective communication
 - effortless distributed action

Valuable Team Practices

- Weekly Release Cycle
 - Plan / Task creation / Task allocation
 - Development
 - Test / Release
- Stand up meetings
- Many whiteboards

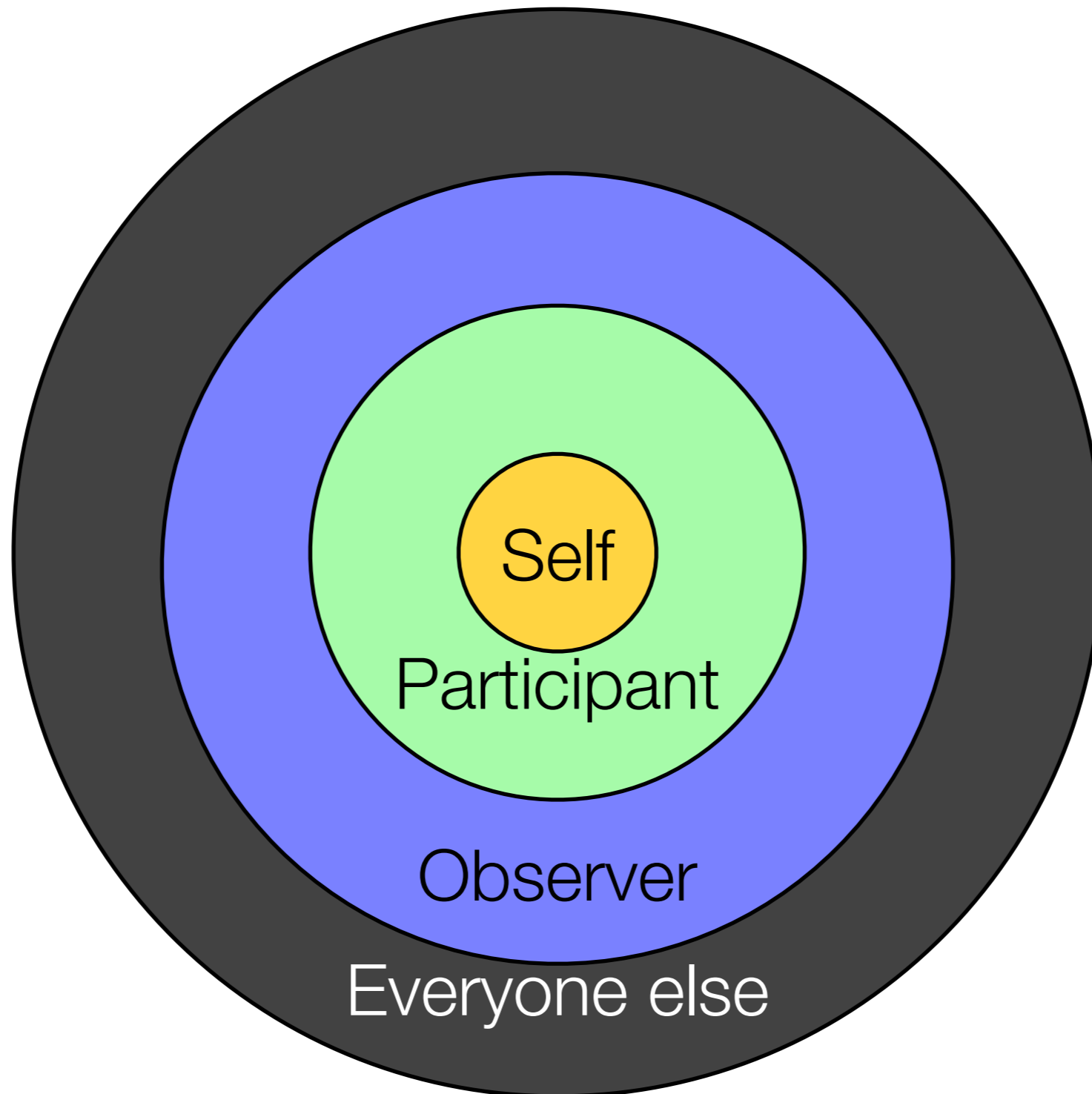
Ultimately About People

- Random collections of people do not result in scaled outcomes
- Specialization emerges:
 - visionaries
 - drivers
 - contributors
 - observers
- There is no group composed solely of people just like you

Presidential Election Example

- Inspiring leader
 - clear consistent message
- Highly motivated team
 - unbelievable sense of shared purpose
- Extremely focused use of communication, fundraising
- Largest agile endeavor I've participated in

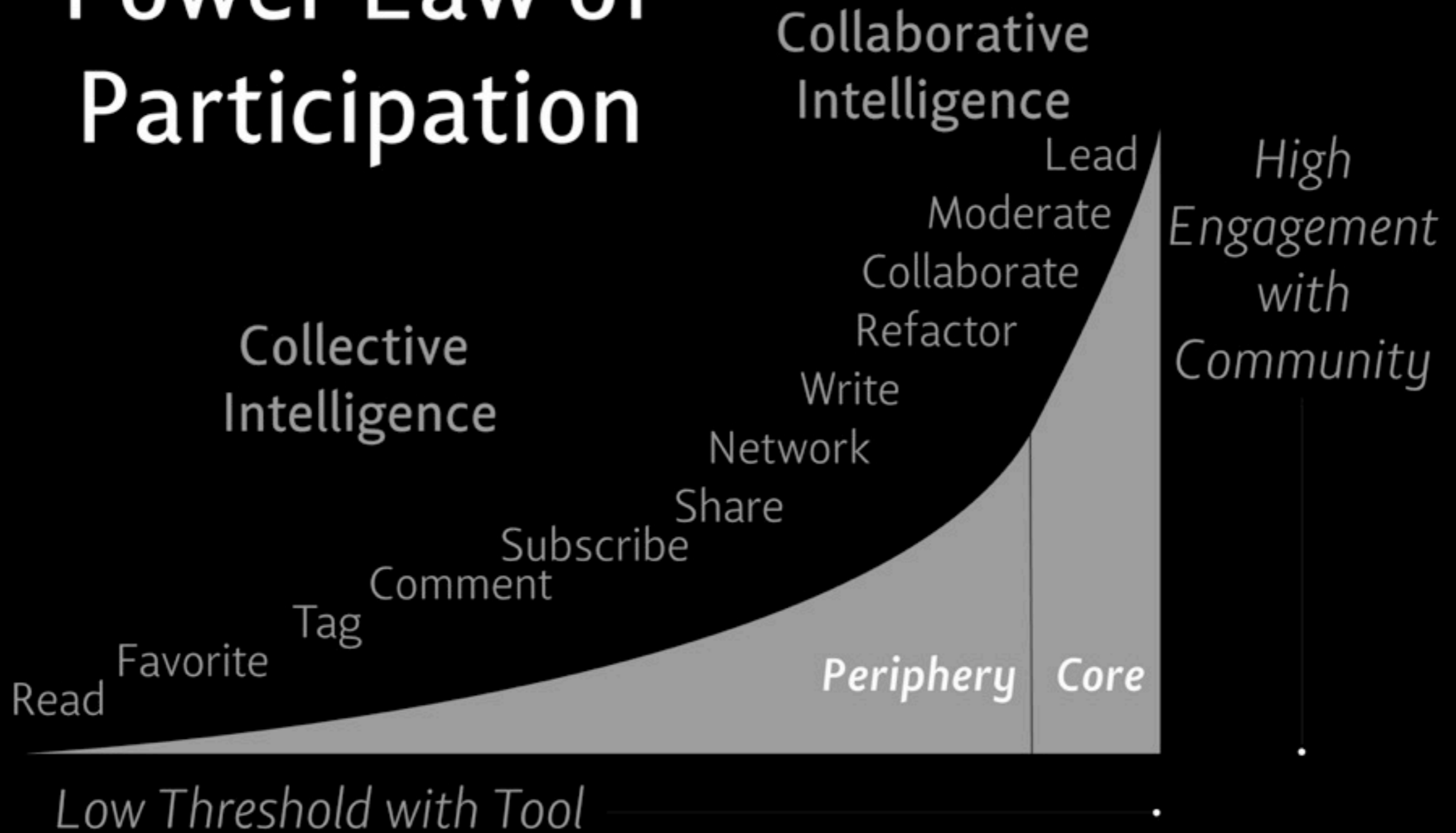
Social Bullseye Model



Universal Model

- Social networks (distance and privacy)
 - self, friend/fan, friend of friend, etc.
- Product Communities
 - creator, contributor, user, etc.
- Organizational structure
 - leader, employees, customers, etc.
- Narcissism or Solipsism???

Power Law of Participation



(CC) Ross Mayfield 2006

Users of a Web Service

- Founder
- Team
- Power User
- Fan
- Observer

History of Technology Lifecycles

- Once upon a time it was prestigious to work at the post office, railroad
- More recently it was the same for the phone company and airlines
- Now it's Google, Apple, Microsoft
- Is there a limit to how long a company can stay cutting edge?
- Are there any 100 year businesses or technologies left?
- We are entering an era where change is the only constant

Back to Software

- Why agile practices in startups?
 - the faster the response to environmental change the better
 - imeem's switch from a primarily P2P to web based DB design
- Unpredictable scaling issues in both hardware and software
 - ability to test multiple permutations quickly
- Find the tools that best accelerate your pace
 - reducing friction, increasing understanding, eliminating indispensibility

Scale Out Ideas

- Server virtualization
 - use when not single resource bound
- Automatic server allocation
 - demands simple server setup
- Database replication and partitioning
 - simple key based partitioning is most feasible
- Cache data both associatively and object at a time

Worth Checking Out

- Trac

- <http://trac.edgewall.org/>

- Nagios

- <http://www.nagios.org/>

- Built to Last, James Collins & Jerry Porras

- Getting Things Done (GTD)

- <http://www.davidco.com/>

Q & A Topics

- Assignment #1
- Upcoming programming project teams
 - no leaders per se, but emergent advocates
 - IRL the best companies are still benevolent dictatorships
- project planning
 - now's the time to advertise!