Changing The World

Through computer science and communities

Robert O'Callahan
Mozilla Corporation

About Me

- Academic career
  - PhD (CMU)
  - IBM Research
- Mozilla career
  - Contributor
  - Developer
  - Manager

Responsibility

- Who is talented?
- What is the original meaning of "talent"?

Matthew 25:14-30

"Again, it will be like a man going on a journey, who called his servants and entrusted his property to them. To one he gave five talents of money, to another two talents, and to another one talent, each according to his ability. Then he went on his journey. The man who had received the five talents went at once and put his money to work and gained five more. So also, the one with the two talents gained two more. But the man who had received the one talent went off, dug a hole in the ground and hid his master's money.

"After a long time the master of those servants returned and settled accounts with them. The man who had received the five talents brought the other five. 'Master,' he said, 'you entrusted me with five talents. See, I have gained five more.'

"His master replied, 'Well done, good and faithful servant! You have been faithful with a few things; I will put you in charge of many things. Come and share your master's happiness!'

"The man with the two talents also came. 'Master,' he said, 'you entrusted me with two talents; see, I have gained two more.'

"His master replied, 'Well done, good and faithful servant! You have been faithful with a few things; I will put you in charge of many things. Come and share your master's happiness!'

"Then the man who had received the one talent came. 'Master,' he said, 'I knew that you are a hard man, harvesting where you have not sown and gathering where you have not scattered seed. So I was afraid and went out and hid your talent in the ground. See, here is what belongs to you.'

"His master replied, 'You wicked, lazy servant! So you knew that I harvest where I have not sown and gather where I have not scattered seed? Well then, you should have put my money on deposit with the bankers, so that when I returned I would have received it back with interest.

"'Take the talent from him and give it to the one who has the ten talents. For everyone who has will be given more, and he will have an abundance. Whoever does not have, even what he has will be taken from him. And throw that worthless servant outside, into the darkness, where there will be weeping and gnashing of teeth.'"

- From the beginning, God-given talent has carried responsibility

- Not just to refrain from evil, but to make the best use of our faculties

The Magic Of Computer Science

- Make things happen at zero marginal cost

- Save one second per user per day

  One life per 84,600 users

- 300M users   3,000 lives

Things That Make Me Cry

Search For Impact

- Who is going to benefit from your work?
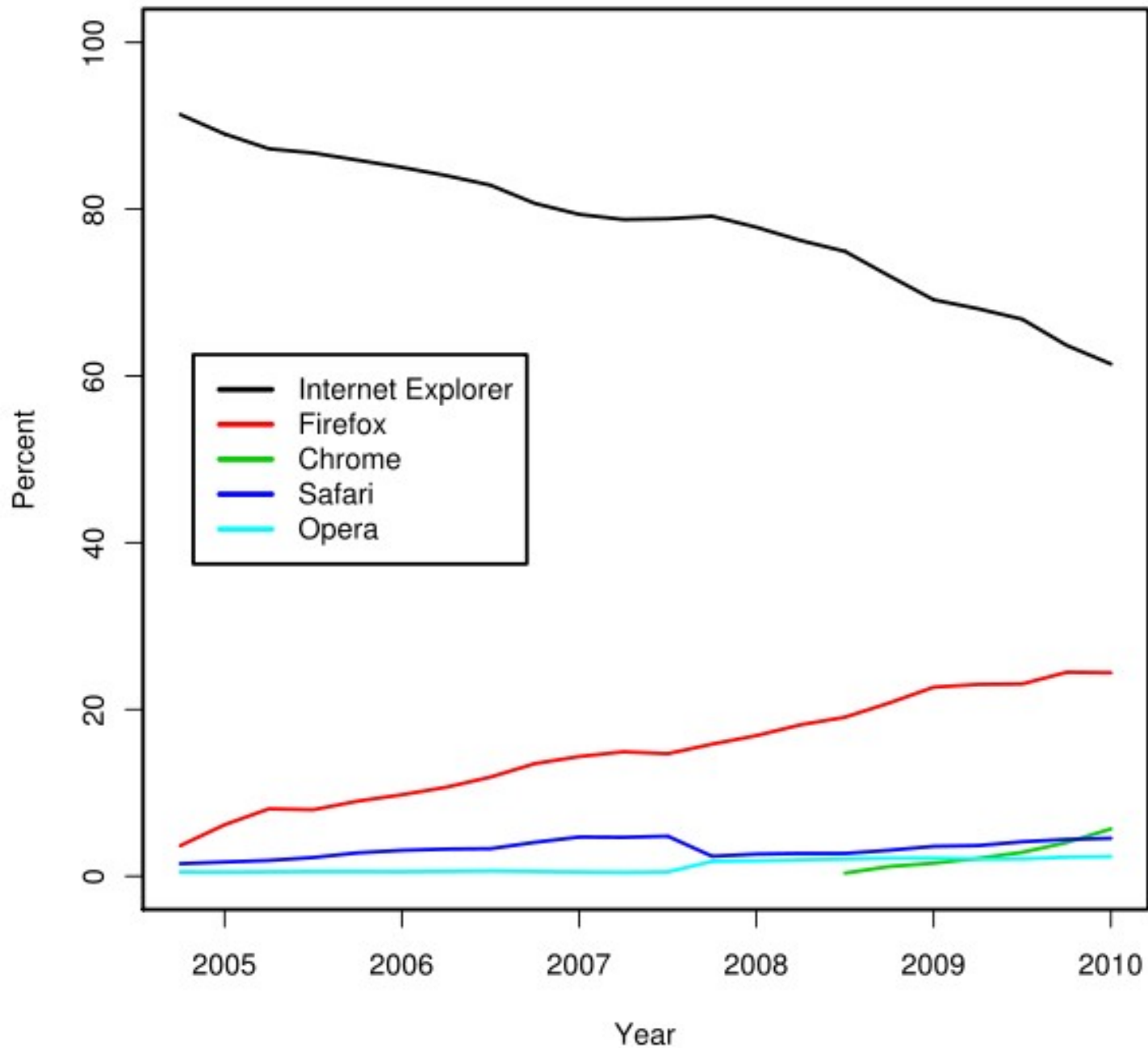- How, and by how much?

- Could talk about research
- Will talk about Mozilla and open source communities instead :-)

Mozilla

Mozilla

- Nonprofit Foundation containing Corporation
- Goal: a better, freer Internet
- Tool: Firefox
  - Improve the Web
  - Fight monopolies
  - Keep players honest
  - Generates funds

Usage share of web browsers

Source: Net Applications

History

- 1994: Netscape begins
- 1998: Open source, Mozilla created
- ...
- 2003: Netscape destroyed
- 2004: Firefox 1.0 released
- Continued Mozilla growth
  - 25-30% market share worldwide
  - 130M ADUs, 250+M users
  - Around 300 full-time staff, 100 (?) developers

Mozilla Activities

- Firefox development
  - Stay relevant
  - Improve the Web user experience
  - Extend and improve Web standards (HTML5, CSS3 etc)
  - Improve the Web via competitive pressure
- Standards development
- Community development
- Strategic investments
  - E.g. `<video>` codecs

My Activities

- Platform development

- Page layout and rendering

  - Features (e.g. CSS3 transitions, calc())

  - Bug fixes (security, interoperability)

  - Performance

  - Standards work (e.g. HTML5, CSS3)

- GPU acceleration framework

- Video (NZ)

GPU Acceleration

- Performance is everything
- GPU underutilized in browsers
- Decouple compositing from drawing
  - Draw to layers
  - Composite layers asynchronously
- Use GPU for compositing and effects
  - Video decoding
  - WebGL

Current State

- Mozilla still growing
- Competition more intense than ever
- Competitors making huge investments
- This is all good
- But we can never, ever rest!

Community

Mozilla Community

- In 2003, Netscape team was terminated

- How do you survive everyone being fired?

- Volunteer community kept the dream alive

Mozilla Community Today

- Developers

- Testers

- Localizers (74 languages, mostly >1 localizer per language)

- Community organizers

- 324 contributor summit invitees

- + addon developers

- + fans

Developing Community

- Open source/free software
  - Freedom to modify
  - Freedom to redistribute
- But software can be "open source" without open development
  - "Throw the code over the wall" approach
- No community

Developing Community

- Use open processes to empower contributors
  - Include in decision-making
  - Force discussions online
- Be geographically distributed
- Firing your employees and hiring your contributors helps
  - Employees who start as contributors are passionate about the project and the community

Developing Community

- Minimize barriers to entry

  - Minimize software process overhead

- Fast release cycle

- Encourage contributors

- Be a project that has impact

- Start with something compelling

Getting Involved

Why Get Involved?

- Have impact

- Learn

- Have fun

- Make contacts

- Build experience

  - Good on your resume

How To Get Involved

- Find something you're passionate about
  - Something that's active
- Don't ask, just do
- Be stubborn
- But take advice
- Have a thick skin

How To Contribute

- Bug reporting/testing a very good entry point
    - Get familiar with the project
    - Can lead into coding
    - Or into spec work etc
- Graphic design
- Coding has the most value
    - A good way to learn

Gender

- Very low female participation
- Many theories
- No progress :-(

Culture

- Relatively low participation from India/China
- Many theories
- Some progress
- High participation from NZ!

Conclusions

- Strive to have positive impact on the world using computer science

- Mozilla is having great impact

- Contributing to open source projects is a powerful way to have impact