

Open Systems: Open Source for the Rest of Us



Eric Scharff

Design, Learning and Collaboration

22-Apr-2002

Overview

- Open Systems
- Open Source
- Open Source + Open Systems

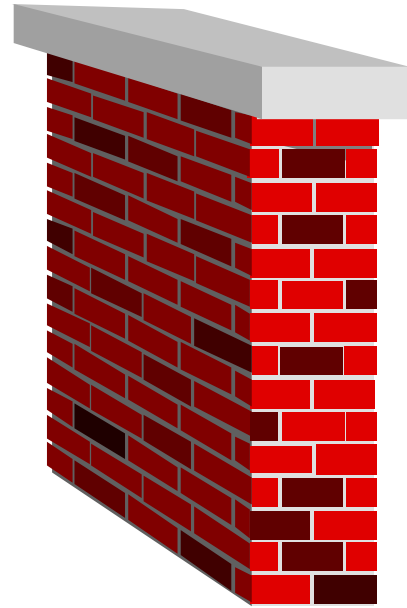
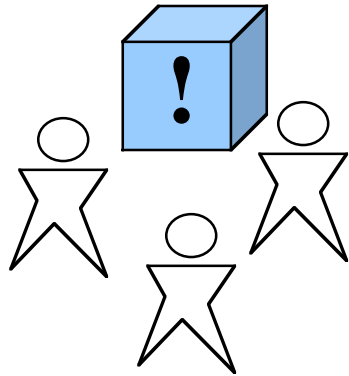
Open Systems

- What are Open (Evolvable) Systems?
 - Collaboration and evolution
 - Open Source and Open Evolvable Systems
- Understanding Existing Open Systems
- Open Evolvable Systems Challenges
 - Supporting Change
 - Coping with change

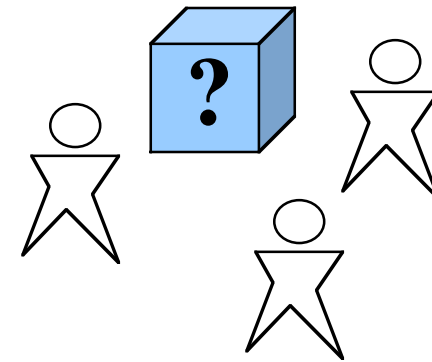
- Why Open Systems?

Design / Use Time

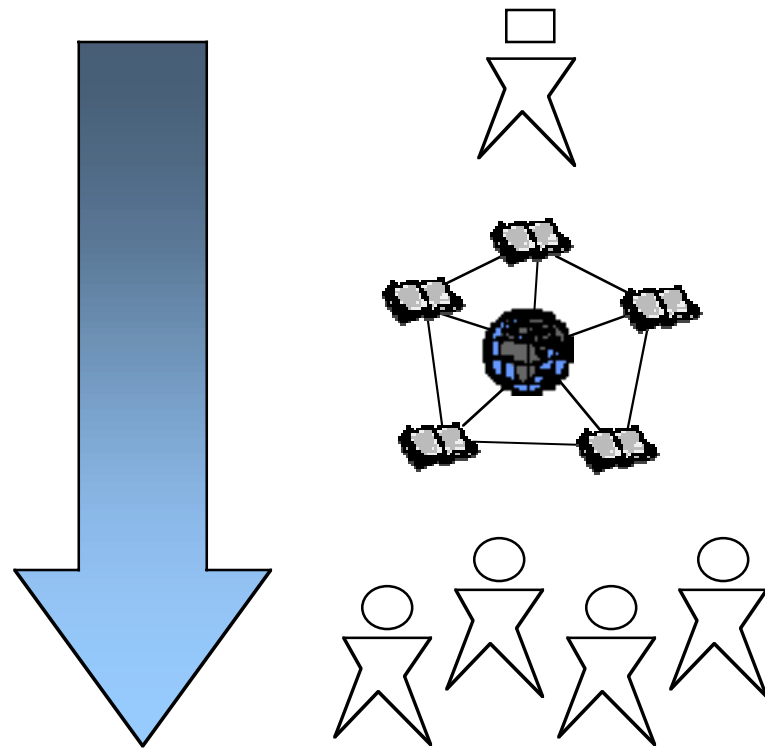
Design Time



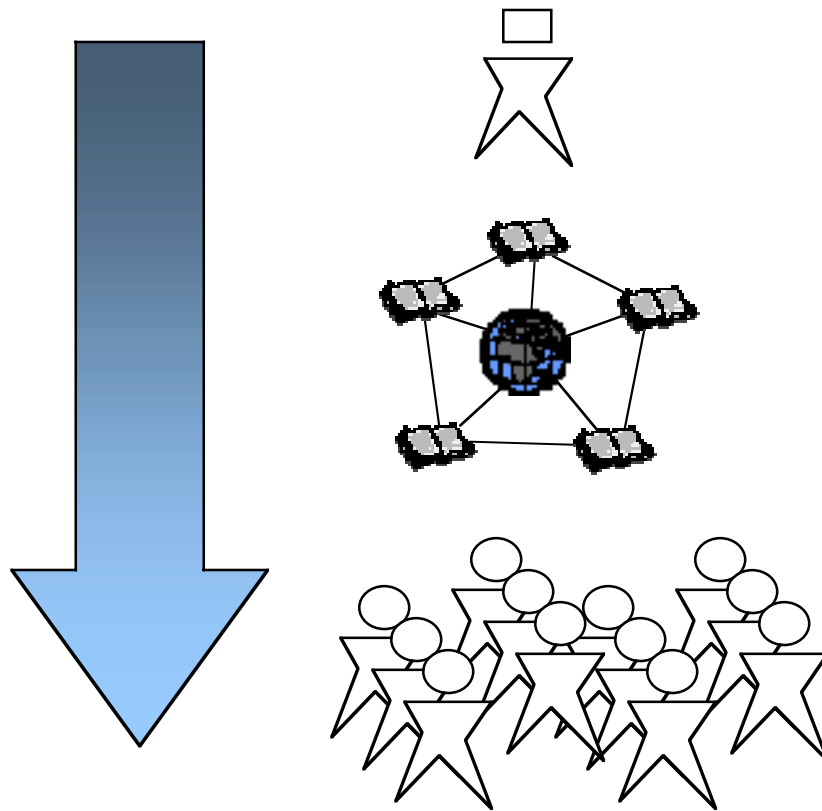
Use Time



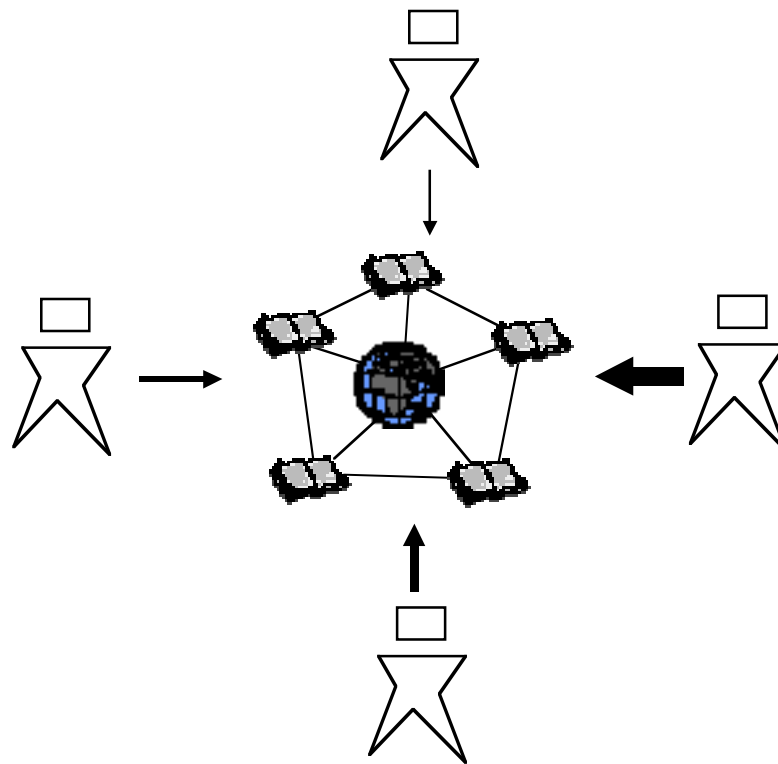
The Access Mindset



The Access Mindset



Collaborative Construction



Ask Jeeves - Ask a question



Ask Jeeves - Get an answer

The screenshot shows a Netscape browser window titled "Netscape: Ask Jeeves Results". The browser's toolbar includes icons for Back, Forward, Reload, Home, Search, Netscape, Images, Print, Security, and Stop. The main content area features a navigation bar with "Home", "About", and "Help" links. Below this is the Ask Jeeves logo and a sidebar titled "JEEVES SERVICES:" with links for "Personal Jeeves", "Money", "Travel", "Health", and "Computers". A large green banner reads "Watch our numbers grow" with the "Lotto Colorado Lottery" logo. The search input field contains the query "How long does it take to hard boil an egg?". Below the input, it states "I have found answers to the following questions:" and lists two related search suggestions: "How can I learn to boil an egg" and "Where can I learn about the skin, hair, or nail condition boils (carbuncles)".

Home • About • Help

Ask Jeeves
Ask.com

JEEVES SERVICES:

- Personal Jeeves
- Money
- Travel
- Health
- Computers

Watch our numbers grow

Lotto
Colorado Lottery

You asked: **Ask!**

I have found answers to the following questions:

- Ask!** How can I learn to ?
- Ask!** Where can I learn about the skin, hair, or nail condition ?

Experts Exchange - Topics

Netscape: Experts Exchange, the #1 Knowledge Sharing Community on the Web.

Back Forward Reload Home Search Netscape Images Print Security Stop

EE Extras
Get Free Stuff

- [Tell a Friend](#)
- [Hall of Fame](#)
- [Get a Free T-Shirt](#)

Most Active
Topic Areas

Select a Topic Area and Ask a Question

Search Experts Exchange

Windows 95
[General](#), [Setup](#), [Windows 98](#), [Windows 2000](#)

Windows NT
[General](#), [Setup](#)

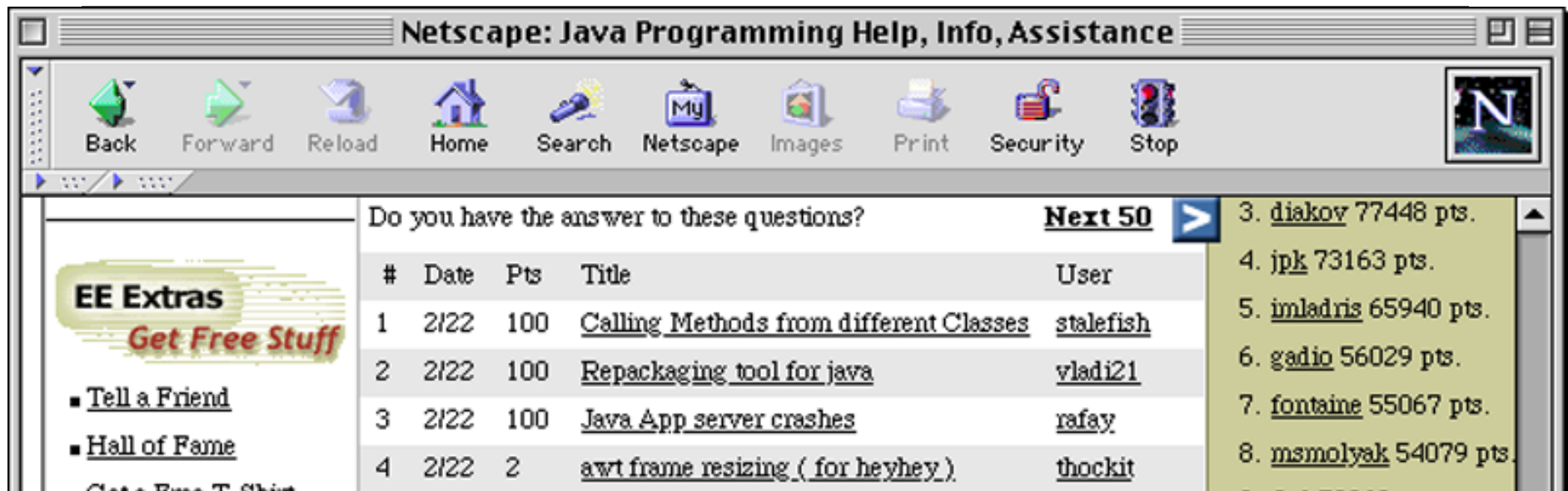
Windows Etc.
[3.x General](#), [3.x Setup](#), [Office-Word-Excel](#), [Outlook](#)

Databases

Programming
[C](#), [C++](#), [Delphi](#), [Java](#), [JavaSc](#)
[Macintosh](#), [MFC](#), [OWL](#), [OS/2](#)
[Pascal](#), [Perl](#), [Unix](#), [Windows](#)
[Visual Basic](#), [VB Databases](#),
[Controls](#)

WWW Development
[Front Page](#) **NEW!**, [Authoring](#),
[CGI](#), [HTML](#), [Images](#)

Experts Exchange - Questions



The screenshot shows a Netscape browser window with the title "Netscape: Java Programming Help, Info, Assistance". The browser's toolbar includes icons for Back, Forward, Reload, Home, Search, Netscape, Images, Print, Security, and Stop. The main content area displays a list of questions under the heading "Do you have the answer to these questions?". A "Next 50" button is visible to the right of the heading. The list of questions is as follows:

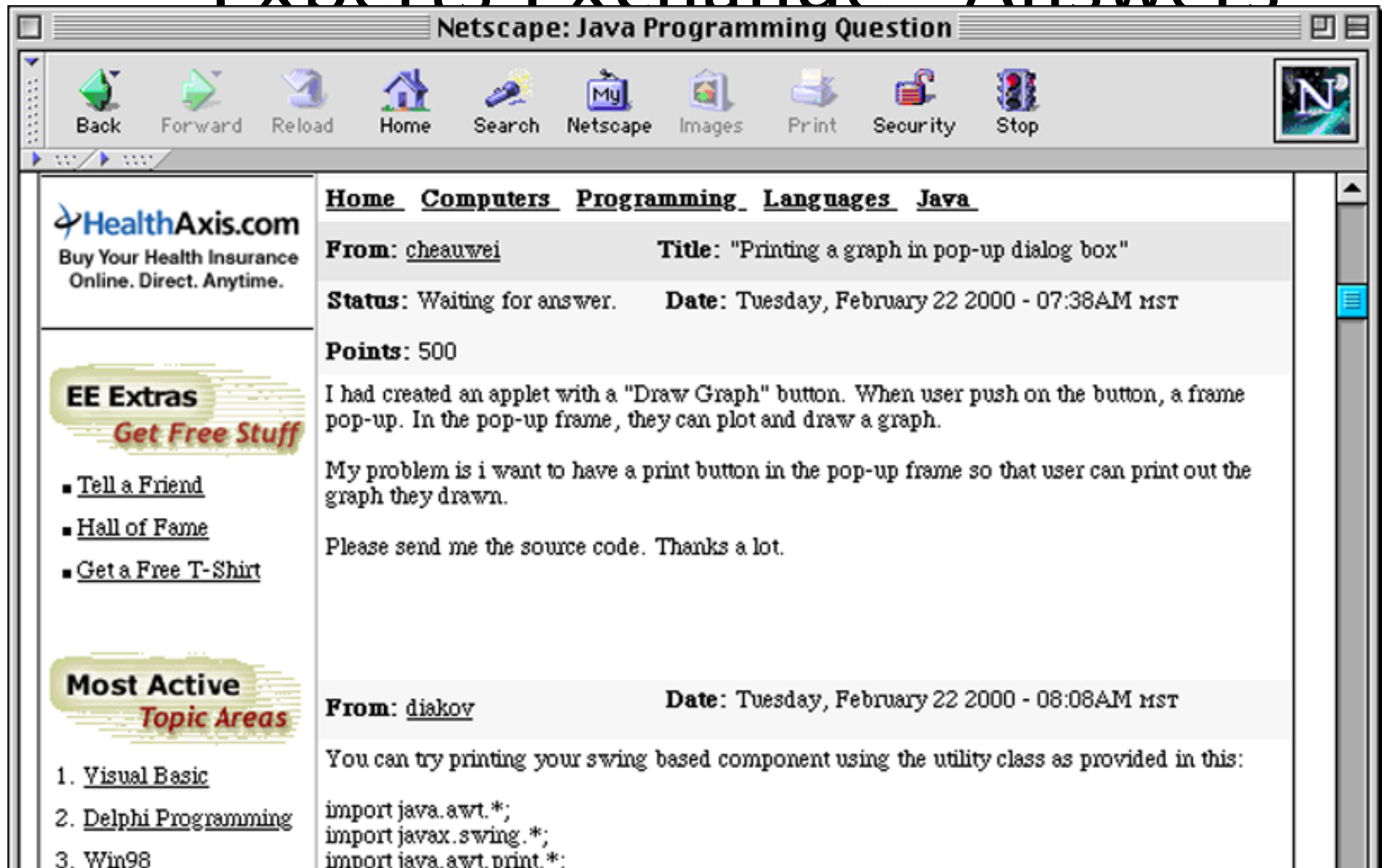
#	Date	Pts	Title	User
1	2/22	100	Calling Methods from different Classes	stalefish
2	2/22	100	Repackaging tool for java	vladi21
3	2/22	100	Java App server crashes	rafay
4	2/22	2	awt frame resizing_(for heyhey_)	thockit

To the right of the table, a list of top users is displayed:

- 3. [diakov](#) 77448 pts.
- 4. [jpk](#) 73163 pts.
- 5. [imladris](#) 65940 pts.
- 6. [gadio](#) 56029 pts.
- 7. [fontaine](#) 55067 pts.
- 8. [msmolyak](#) 54079 pts.

On the left side of the browser window, there is a sidebar with the heading "EE Extras" and the sub-heading "Get Free Stuff". Below this, there are links for "Tell a Friend" and "Hall of Fame".

Experts Exchange - Answers



The screenshot shows a Netscape browser window with the title "Netscape: Java Programming Question". The browser's toolbar includes icons for Back, Forward, Reload, Home, Search, Netscape, Images, Print, Security, and Stop. The main content area displays a forum post with the following details:

Home Computers Programming Languages Java

From: [cheauwei](#) **Title:** "Printing a graph in pop-up dialog box"

Status: Waiting for answer. **Date:** Tuesday, February 22 2000 - 07:38AM MST

Points: 500

I had created an applet with a "Draw Graph" button. When user push on the button, a frame pop-up. In the pop-up frame, they can plot and draw a graph.

My problem is i want to have a print button in the pop-up frame so that user can print out the graph they drawn.

Please send me the source code. Thanks a lot.

From: [diakov](#) **Date:** Tuesday, February 22 2000 - 08:08AM MST

You can try printing your swing based component using the utility class as provided in this:

```
import java.awt.*;
import javax.swing.*;
import java.awt.print.*;
```

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EE Extras
Get Free Stuff

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- [Hall of Fame](#)
- [Get a Free T-Shirt](#)

Most Active
Topic Areas

1. [Visual Basic](#)
2. [Delphi Programming](#)
3. [Win98](#)

Closed and Open Systems

- Ask Jeeves
 - Professional 'experts' answer questions
 - Staff chooses what questions to answer
 - No understanding of quality of answer
 - Unanswered questions are "invisible"
- Expert's Exchange
 - Many people contribute knowledge
 - People contribute answers to posed questions
 - Answer assigned "points" by questioner
 - Community notified if no answer exists
- Closed Evolution
Controlled by Staff
- Open Evolution
Controlled by Users

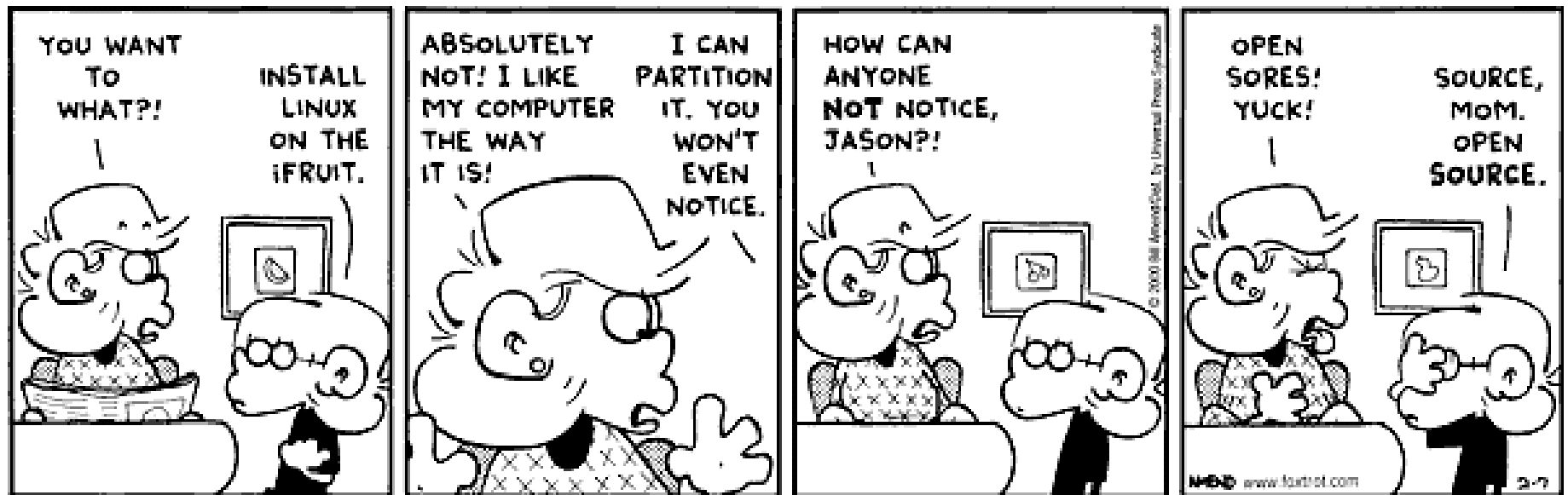
Open Evolvable Systems

- Open Systems are processes in which change is possible “at all levels.”
 - Processes change
 - Change is a “first-class activity”
- Easiest to contrast with closed systems, where boundaries are fundamentally fixed.
- Important for wicked and inherently collaborative problems
- ◆ Socio-technical problem

What is Open Source?

- A software engineering technique?
- A mindset?
- A culture?
- A religion?

Open Source is Misunderstood



Open source is NOT

- Zero cost software
- Zero cost labor
- Completely decentralized
- Lacking fixed goals
- A “hacker phenomenon”

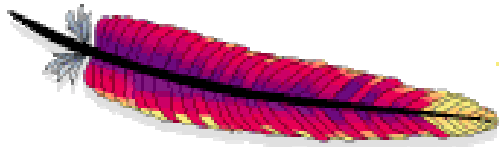
Perspectives on Open Source

- Software design, intellectual property, high quality software dominant perspectives
- Open source is this and more...
 - “Given enough eyeballs, all bugs are shallow” (Raymond, 1998)
 - “Free software is a matter of liberty, not price” (Stallman, 1992)
 - “Open source folks tend to build the tools they need or wish they had” (Vixie, 2000)
 - “Now, this talk is supposed to be about the Culture of Perl. Some would say “What Culture?” To which the only adequate response is, “Well, given a suitable medium, even bacteria are allowed to have a culture.” (Wall, 1997)

Collaborative Construction

- Open source software communities provide examples of ongoing activities where people understand and solve problems of mutual interest.
 - Social *and* technical process
 - Complex interrelationships
 - Continuous evolution
- Collaborative construction facilitates application outside of software design

Case Studies



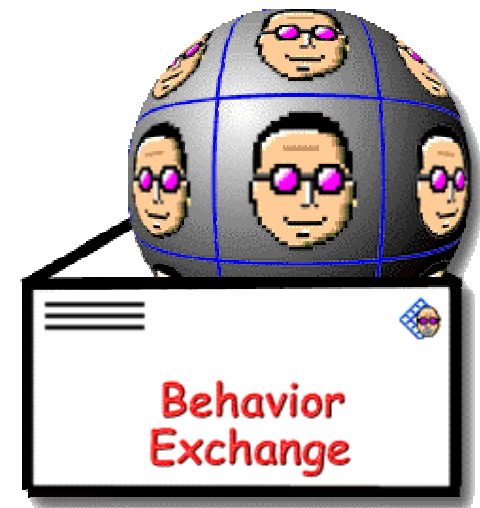
Case Studies (2)

じゅん

PostgreSQL



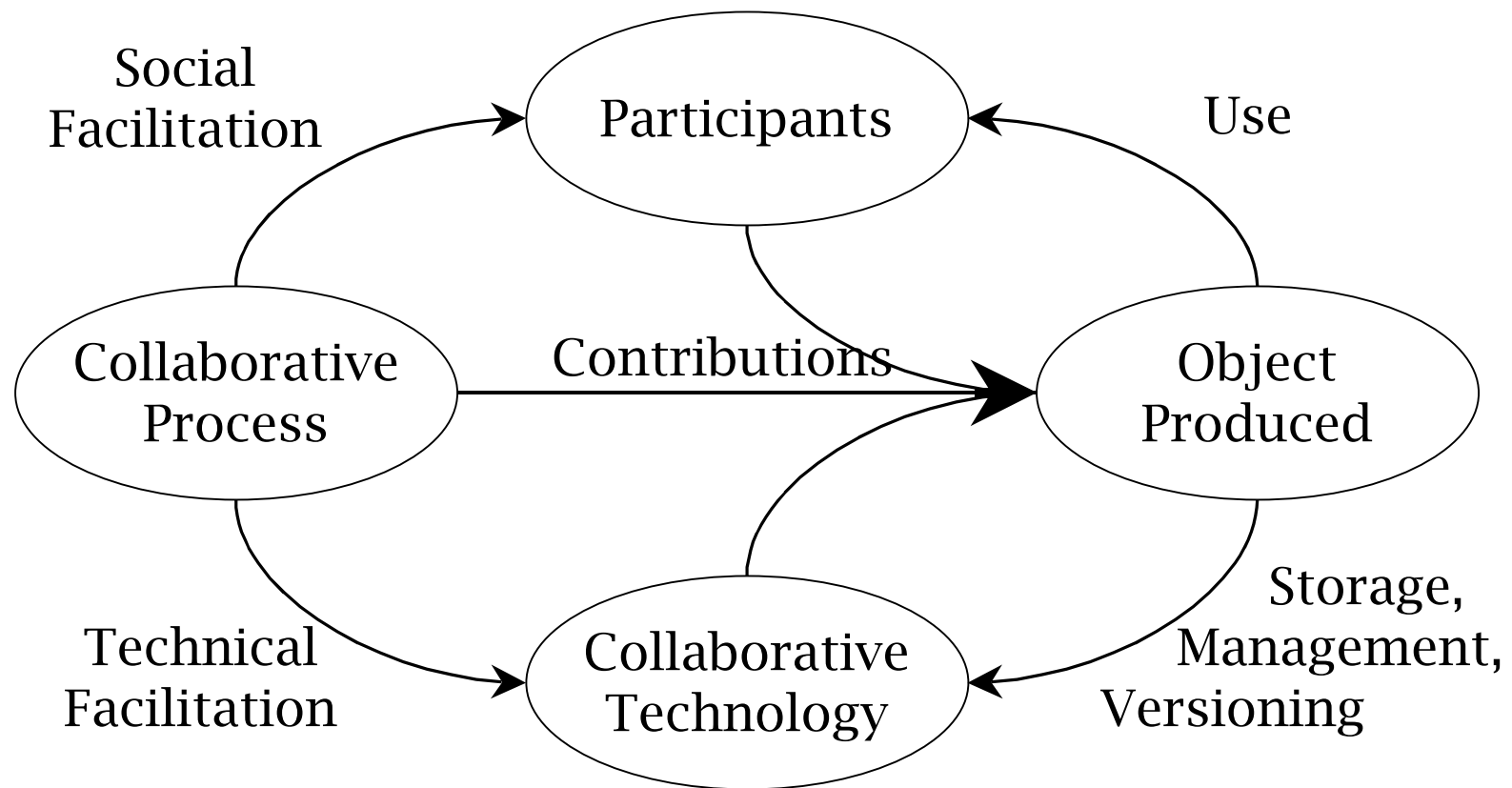
expertsXexchange

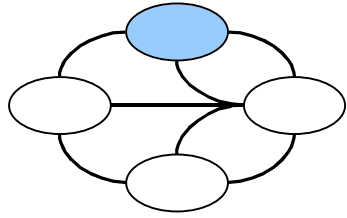


Open Source Framework

- **Definable Project**
- **Exciting Project**
- **Project Leader**
- **Work Assignments**
- **Participants**
- **Standard Distribution**
- **Project Framework**
- **Collaborative Technology**
- **“Wish List” or TODO list**

Generative Framework

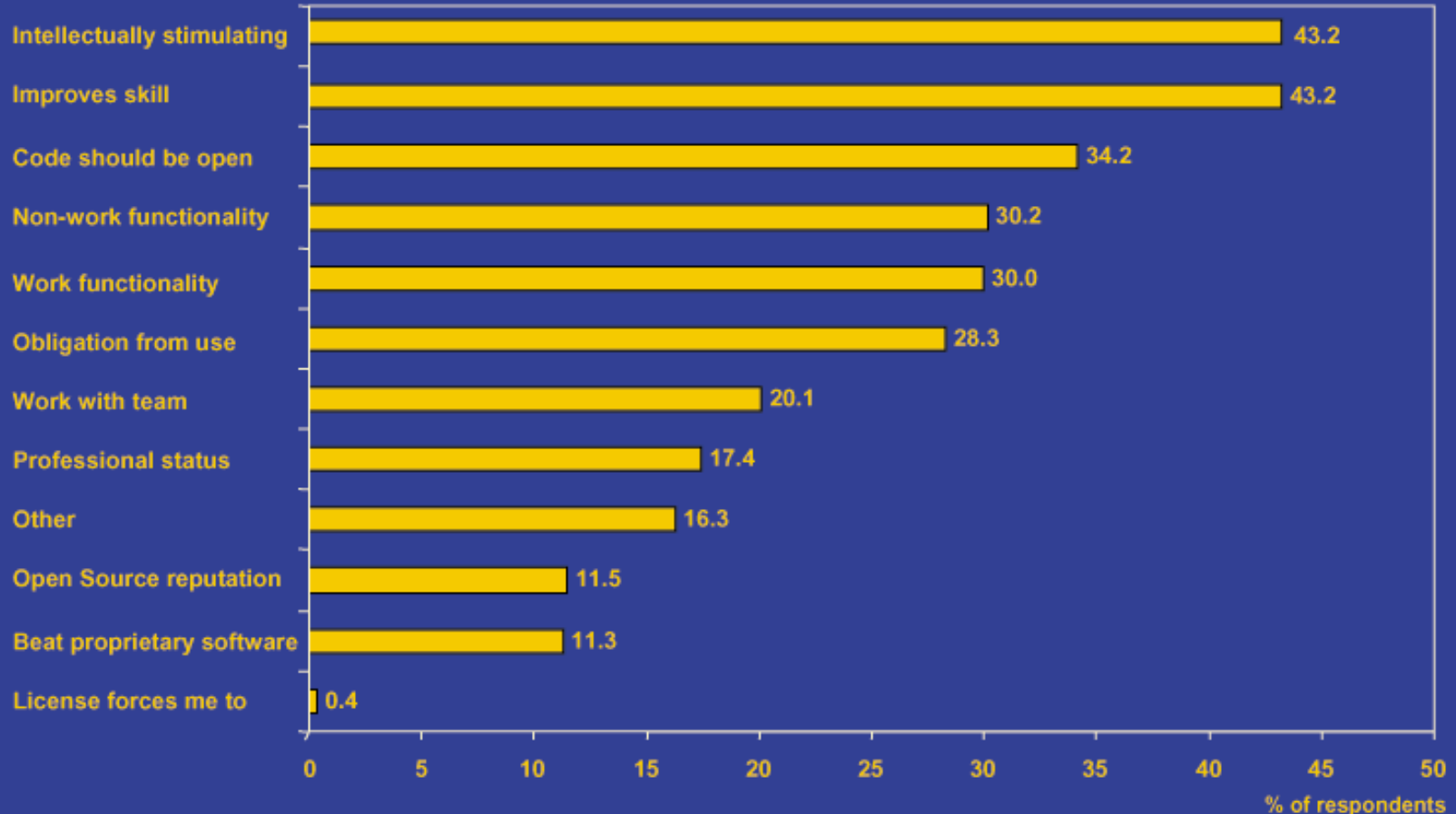




Participants

- Active contributors through creation, use, and refinement of the system
 - continuum of involvement
 - inclusive process (?)
- Motivation Challenge (why do it?)
 - personal interest / utility
 - social capital
- Course design
 - mix of intrinsic and extrinsic motivators
 - personally meaningful projects

OVERALL HACKER MOTIVATIONS

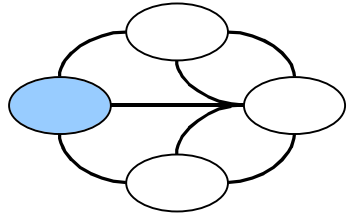


Note: Question asked for top three motivators of F/OSS participation

Details

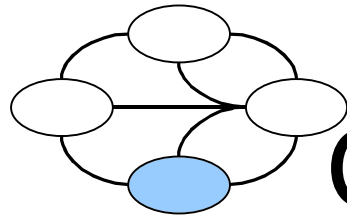
Flow

- 63% - This project is as creative as anything I have done
- 72% - When I program, I loose track of time
- 59% - with one more hour in the day, I would spend it programming
- 48% - like composing poetry or music



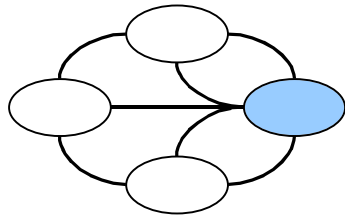
Collaborative Process

- Social conventions emerge governing communication and change adoption
 - encourage participation
 - creation, sharing, adoption of changes
- Leadership Challenge (who does it?)
 - leadership emerges naturally from activity
 - open participation versus leader control
 - leadership is hard
- Course design
 - project team leadership emerged
 - initial project ideas from my “wish list”



Collaborative Technology

- Tools used to communicate and coordinate development
 - communication - email, chat
 - coordination - CVS
- Coordination Challenge (how is it done?)
 - managing heavy traffic
 - duplication of effort
- Course design
 - Swiki - open collaborative Web site building
 - overcome “media competition”



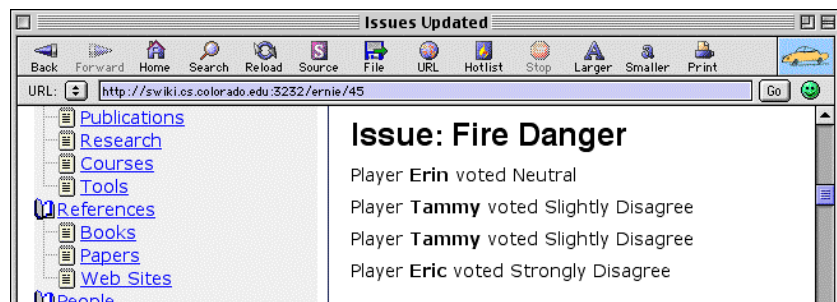
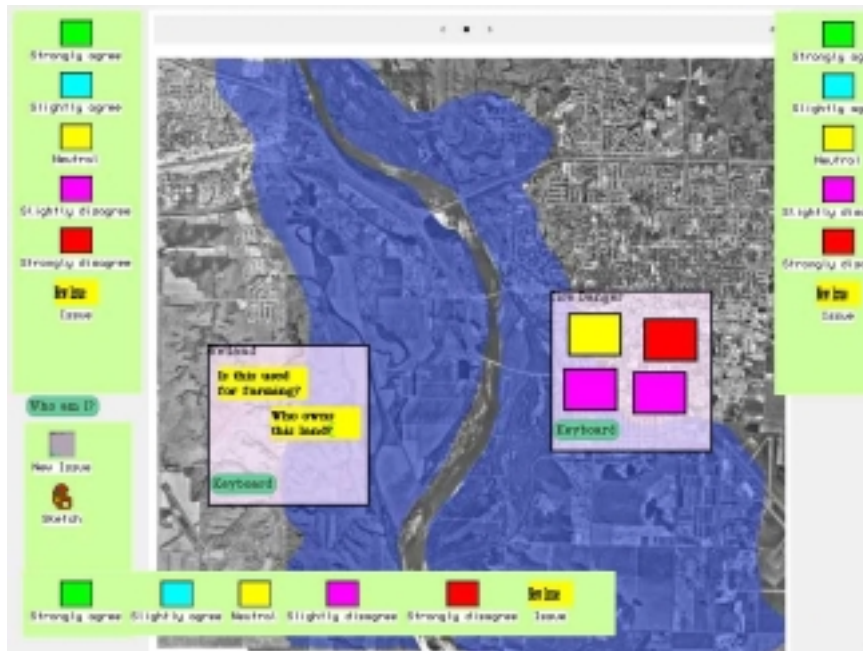
Object Produced

- Concrete artifacts that comprise the software system
 - software system used by participants
 - non-software objects (examples, documentation)
- Extension Challenge (how does it change)
 - systems need to grow through change
 - competency to make changes required
- Course design
 - EDC extension
 - Swiki contribution

Open Source & Open Systems

- What happens when the object produced isn't a software system?
- “Open Source for the Rest of Us”
 - non-technical problem domains
 - user communities not entirely software builders
- Aspects of open systems
 - provide opportunities for extension and modification as part of their use
 - grow through this extension process
 - support users needs to collaboratively construct
 - facilitate open (inclusive) participation in open (ended) domains

EDC



EDC Redesign

- Motivation Challenge
 - new domain models and participants
- Leadership Challenge
 - allow leadership to emerge
- Coordination Challenge
 - utilize Swiki technology
- Extension Challenge
 - improved physical object recognition and software infrastructure

Framework Adoption Challenges

- Finding common ground
 - Acknowledge “symmetry of ignorance”
- Getting users to participate
 - Tasks not perceived as collaborative
 - Handle real problems shared by people
 - Motivation (lack of time / inclination)
 - Be as inclusive as possible
 - Lack of technical sophistication
 - Provide many avenues
- Handling change
 - Evolution a result of change in context