

Computer, Neural, and Social Networks

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- Your brain functions a lot like the Internet or a network of friends, scientists said Tuesday.
- They conclude the human brain can be visualized as a complex interacting network that relies on nodes to efficiently convey information from place to place.
- Very few jumps are necessary to connect any two nodes, the study found.
- "This so-called 'small world' property allows for the most efficient connectivity," said Dante Chialvo, a physiologist at Northwestern University.
- Other networks -- social and biochemical -- rely on the same principle.

They found that many of the nodes had only a few connections, and a small number of nodes were connected to many others. These "super-connected" nodes act as hubs -- as with the Internet or your most gossipy friend -- getting the word out quickly and widely. So maybe, the thinking goes, if you can figure out how the Internet works -- or why your gossipy friend succeeds -- then you can grasp your own mind.

Or, put more scientifically, these findings of basic principles of brain function suggest "that the underlying properties can be understood using the theoretical framework already advanced in the study of other, disparate, networks,"

Networks

- A network is a group of individuals with **limited communication**.
- A nuclear family, team, or work unit is not a network.
- Shared memory computers are not networks.
- There is nothing in the brain like shared memory, but there is shared context (attention).

Action by Networks

- It seems to be inherently hard to get coherent action from networks.
- There is still essentially no parallel computing on an indivisible task. Even some theorems .
- Some results from neural computation – can't propagate distributed representations.
- Communes have not been stable - impose structure for management of tasks.

Social Collaboration and Community Action

- Lots of attention in recent years to “social networks” and other types of community-action
 - *See, e.g., Benkler “The Wealth of Networks”*
- Critical mass of participation in social networks – generally – far exceeded
- Yet it still seems to be inherently hard to get coherent action and work-product from networks

What Type of Collaboration?

- “Democratic” collaboration
 - Enabling “networked” production for groups that lack pre-existing / well-defined institutional structure
 - Groups that are more “flat” in their organization
- Examples:
 - Clubs, Boards, etc.
 - Communities of Practice
 - Classes, Conferences, etc.

Why is Collaboration Hard?

- Communications Congestion?
 - $O(n^2)$ one-to-one communications channels, worse if consider interaction among sub-groups
- Existing software targeted to organizations which have pre-existing imposed (usually heierarchical) structure
- This isn't the type of collaboration we're trying to facilitate (that problem is already well-studied)

Why is Collaboration Hard?

- Targeted groups lack either technical skill, the resources to acquire (purchase) such skill, or both
- Lack of formal structure combined with spatial/temporal separation of members creates a “melee” of producers (community members)

Community Action

- Many Formal and Informal Communities
 - Clubs, Boards, etc.
 - Communities of Practice
 - Classes, Conferences, etc.
- Democratic Production and Decisions
- No Access to Technical Wizardry
- Many Potential **Distributed** Communities

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Little System Support and

Very Few Instances

What is CoPE?

- A web-based tool for groups to democratically work together and decide upon actions of common interest.
- This includes...
 - Creating and sharing ideas/information
 - Discussion
 - Making decisions as a group

Goals

- Easy to use without having wizardry
- Non-proprietary, free to setup and use
- Fairly customizable
- Functionality
 - Organize and Democratically Govern
 - Produce Work Products as Documents
- Institutional Support; repository, search

Document Centric

- “Work” in CoPE is represented in the form of a document (Plain text, MS Word, PDF, etc.)
- These could be anything like...
 - Proposals
 - Group budget report
 - Institutional Bylaws and Minutes
 - Best Practices Guides

Implementation

- CoPE is built by modifying an open source content management system called Plone (<http://www.plone.org>)
- Presentation code is written mostly in HTML and CSS
- Back-end logic is written in Python

What CoPE is Not

- Not a tool for group editing (Microsoft Word , etc. better at this)
- Not a tool for version control and management (CVS)
- Not a tool for synchronous collaboration (live virtual meetings, chat)
- Not an unstructured forum like a wiki

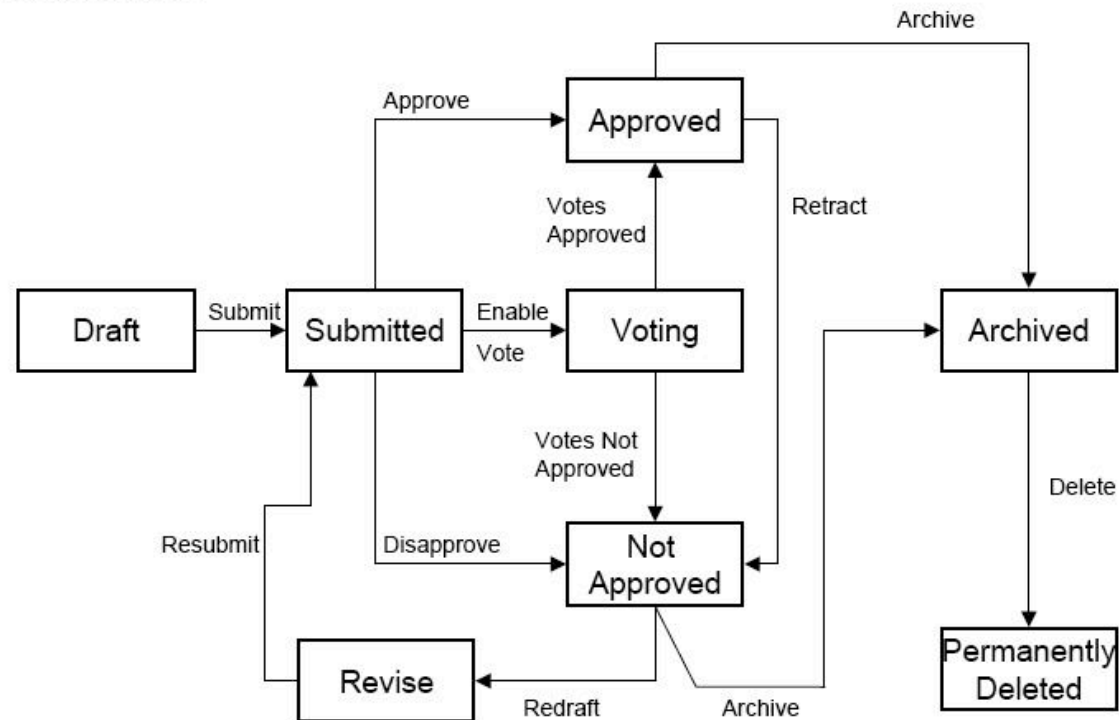
Key Features: Workflow

- Documents go through different states of a workflow
- Starts out in “draft” state. The ultimate goal is to get to the “approved” state
- Depending on the state, there are different permissions (view, edit)
- Workflow is customizable based on the groups business processes

Key Features: Workflow

CoPE Workflow

Last Updated 08/10/05



Key Features: Coordinator

- Each CoPE site has a coordinator
- The coordinator is like a group leader and facilitator
- The coordinator is responsible for...
 - Creating/editing the folder structure of the site
 - Calling votes
 - Configuring the CoPE site
 - Handling membership
 - And more...

Key Features: Configuration

- A CoPE site can be configured based on a discrete set of parameters
- Some examples of configurable options are...
 - Voting mode
 - Maximum number of members allowed
 - Coordinator's privileges

Related Project - *Deme*

- Stanford University, Todd Davies
- Goals generally similar to CoPE
- Comprehensive support for Communities
- Working with East Palo Alto Community
- Client side operations, not thin client
- Open editing, ala Wiki

<http://www.groupspace.org/news.php>

Commercial Effort - BSCW

- Basic Support for Cooperative Work
- Widely used in Europe, ? U.S.
- Commercially supported
- No governance facilities
- Simpler than U.S. commercial systems

<http://bscw.fit.fraunhofer.de/>

“Openness” Risk

- “Open” software is generally cooperative
 - “Abuse” of these models is highly frowned upon by the technical/open source/hacker communities
- Yet, such abuse occurs – e.g., the writing of “spam” bots to create false accounts on Zope/Plone servers for posting unsolicited and/or illicit advertising

Short “Stability” Lifespan

- It is well-known that Microsoft platforms are the target of malicious software and required frequent updating
 - *nix systems were not considered a common target and as such did not require as much advance planning for upgrades
- Recently “malware” has begun targeting other platforms and platform-independent applications such as web platforms like Zope / Plone

Short “Stability” Lifespan

- So, product updates are becoming more frequent (in non Microsoft products)
 - These updates are often because of information assurance issues, not feature additions
- The result: the “stability” lifespan has significantly shortened for Internet-enabled applications.

Demo

- <http://cope.icsi.berkeley.edu>
- Login Stanford#
- Creating Documents
- Commenting
- Voting

The End

- Questions?
- Thanks!
- To learn more about CoPE go to <http://cope.icsi.berkeley.edu>

- Contact Information

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