

Understanding Social Networks

Jennifer Golbeck

The iSchool - College of Information Studies

HCIL



Behavior and Dynamics

- Social networks are not static.
 - Relationships constantly change, are formed, and are dropped.
 - New people enter the network and others leave
- Do people behave the same way in social networks on the *Web*?



Questions

- How do these networks grow (and shrink)?
- How are relationships added (and removed)?
- What affects social disconnect?
- What affects centrality?



Methodology

- 24 month study
- Automatically collected adjacency lists (everyone and who they know), join dates, and last active dates for all members in 13 networks.
 - December 2004
 - December 2006
- For 7 networks, I collected adjacency lists every day for 7 weeks.
 - Who joined or left
 - What relationships were added or removed



Networks



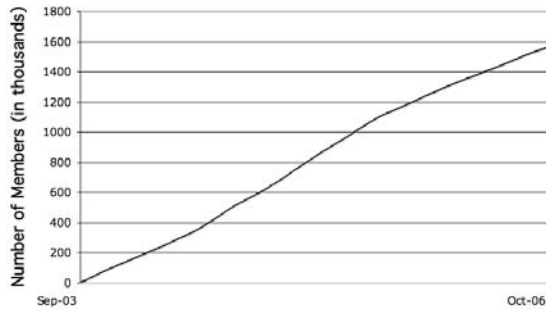


Network Growth

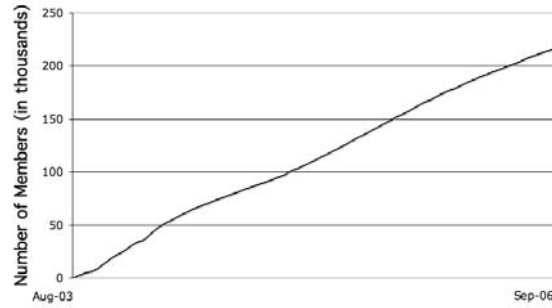
- People do not leave social networks
 - On sites with a clear simple process, less than a dozen members leave per day
 - In some networks, essentially no one has ever left
- Lots of people join social networks
 - For ten networks we knew the date that every member joined the network
 - Networks tend to show linear growth
 - The slope can shift
 - Usually occurs suddenly
 - Explained by some event

Normal

GreatestJournal Membership Growth



Tribe Membership Growth

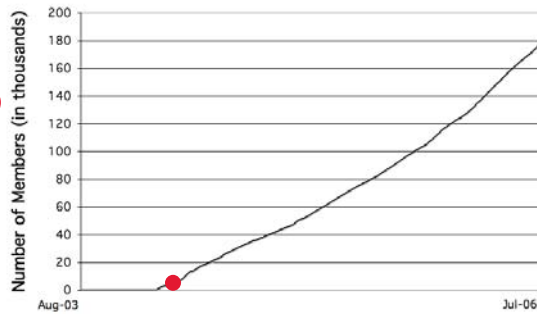


Mobango Membership Growth

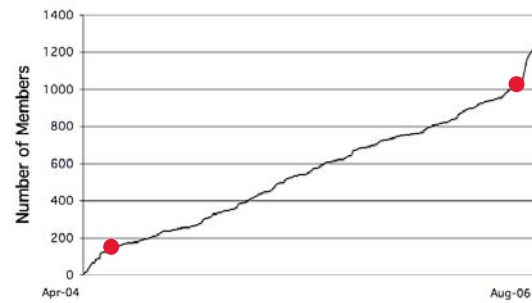


Changes

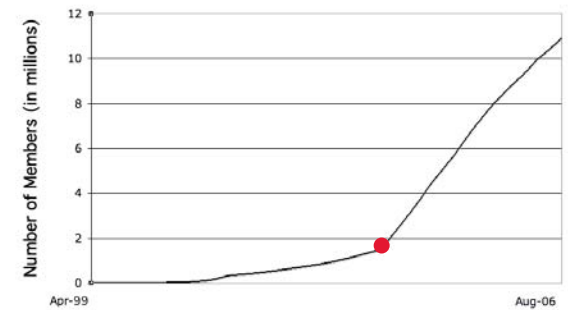
Dogster Membership Growth



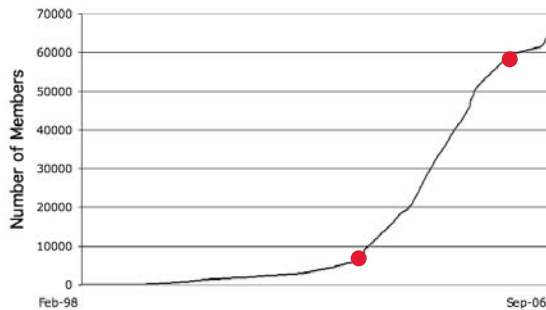
Hamsterster Membership Growth



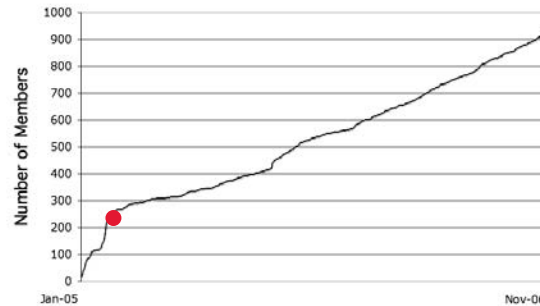
LiveJournal Membership Growth



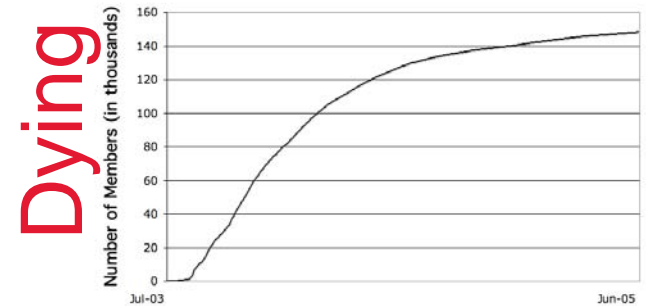
Ecademy Membership Growth



FilmTrust Membership Growth



Hipstir Membership Growth

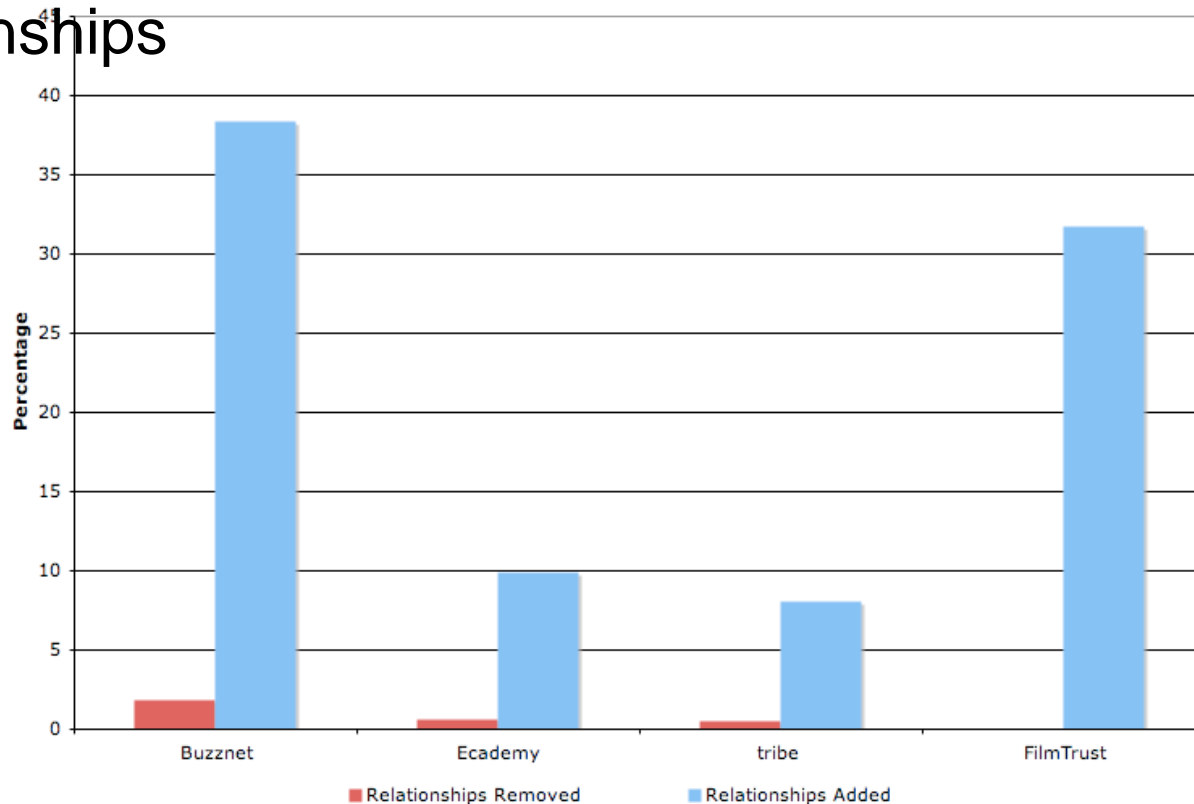


Dying



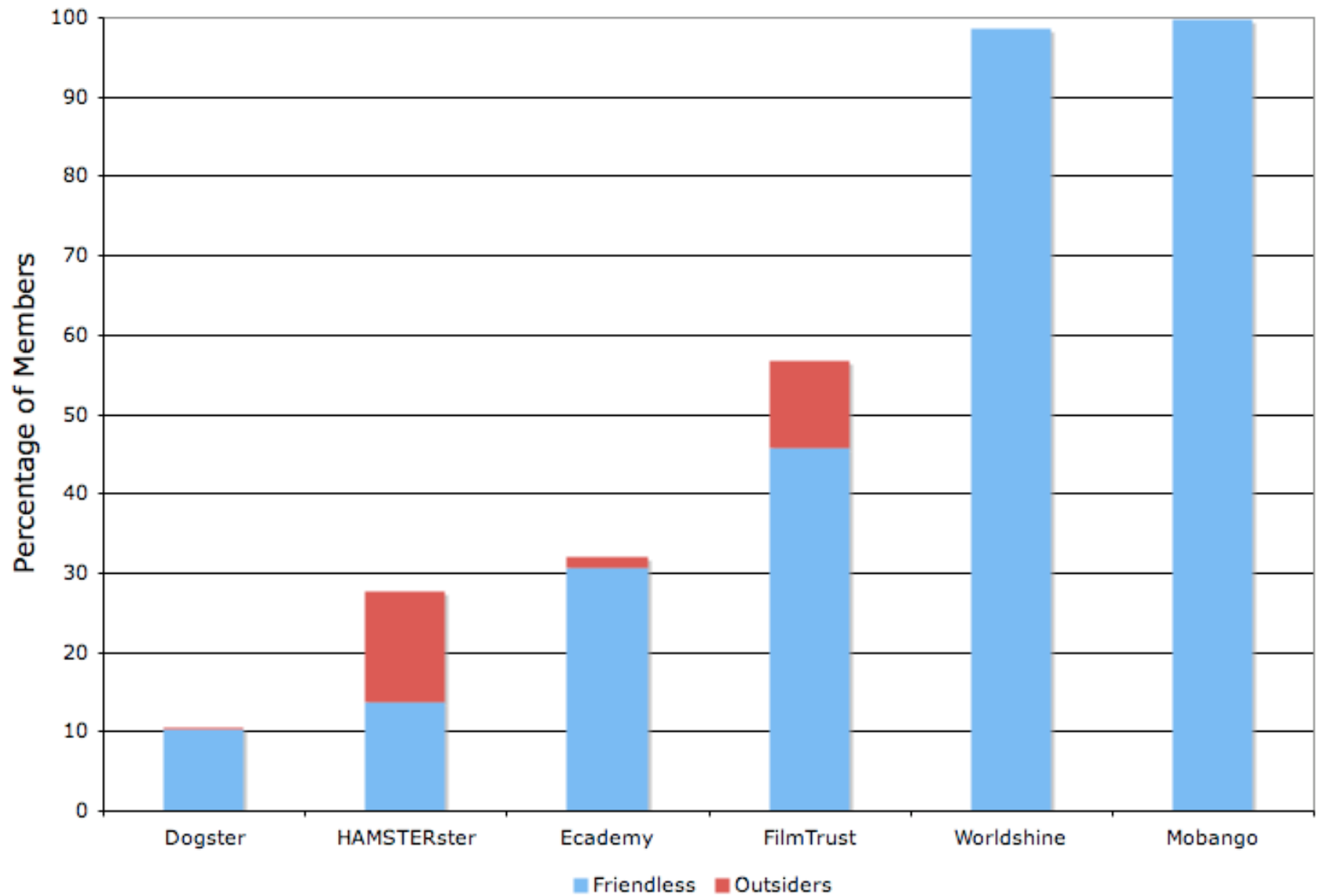
Relationships

- Forming relationships is the basis for social networking
- There is a strong social disincentive to remove relationships



Directed

Edgeless





Centrality

- Other than having lots of friends, what makes people more central?
 - Average shortest path length as centrality measure
- Activity
 - Consider join date, last active date, and length of activity (last active date - join date)
 - Compute rank correlation with centrality
 - Medium strength correlation (~ 0.5) between duration and centrality



Lessons

- Media Matters
 - Networks follow a linear growth pattern, where the slope shifts in response to media events
- A snapshot of a network contains its entire history
 - People do not leave and rarely delete relationships
- Greater non-networking purpose leads to less social connectivity
- Early Adopters + Continued Activity = Higher Centrality



- Paper is available at First Monday, November 2007
- jgolbeck@umd.edu
- <http://www.cs.umd.edu/~golbeck>