Understanding Social Networks

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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 Changes Dying

GreatestJournal Membership Growth

Tribe Membership Growth

Mobango Membership Growth

Dogster Membership Growth

Hamsterster Membership Growth

LiveJournal Membership Growth

Ecademy Membership Growth

FilmTrust Membership Growth

Hipster Membership Growth
Relationships

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