Critical mass in the use of technologies of social mediation

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Background

• Drawn from the *Taken for Grantedness*
• Examine the assumption of critical mass and its effects on the adoption of social mediation technologies
• General argument
  – **Dyadic** (and standardized) communication devices/systems become increasingly networked
  – As the density of the network increases, users can begin to mutually assume that others are also users.
  – Conditions push (coerce) people to use the interaction form
  – When people believe that a mediation form is universal, their belief is real in its consequences
Technologies of social mediation

- Critical mass
- Supporting ideology
- Changes in the social ecology
- Reciprocal expectations
Technologies of social mediation

• Critical mass (Specifically the perception of critical mass)
  • Supporting ideology
  • Changes in the social ecology
  • Reciprocal expectations
Source: New York Times
The career of a social mediation technology
The career of a social mediation technology

Take off zone
Sub- critical density
The Mobile Video Telephony network evolution

Focusing on the video-links

increased # of adopters in LCC

Q307  Q407  Q108

LCC: 4.7%  LCC: 5.2%  LCC: 2.6%

collapse of LCC

Q208  Q308

LCC: <0.01%

Q408  Q109  Q209  Q309
Nuclear fission

- There needs to be a certain probability that the neutron hits another atom.
- There needs to be a density of atoms.
- There is not a previously existing bond between the atoms that makes them more likely to be hit by a stray neutron.
Questions regarding the metaphor when applied to tech. adoption

• Individual level
  – Are we loaded and waiting to explode (consume)?
  – Do we explode when a neutron of inspiration hits us?
  – What is the process by which we are “loaded”

• Social level
  – Are the mouse traps that are immediately adjacent more important than those that are more distant?
  – Technical adoption
    • Issues of homophily
    • The influence of pre-existing social ties
What about. . .

• The role of the enthusiastic hobbyists/tinkerer
• The role of homophily and social ties
• Standardization
• Financial muscle and commercial actors needs to be in place that are push the technologies
• Eventual role of public infrastructure
• Broader social stability
Other type of relationship

Company
• Existing system (the mail)
• Tinkerer
  • Incurs high costs and low benefits
  • Expects to obtain future gains when (if) others follow
  • Is a missionary
  • If they do not see a future use they will reject a technology
Tinkerer with a budget

Willing (if un-witting) partner
Structuring of the social ecology (buying PAIRS of fax machines)

- Producers are committing themselves to production
- Prices start to fall
- There is some press coverage
- Standardization is starting to coalesce (one will eventually win)
- There is a public (or publically accessible) infrastructure
- Commercial actors are touting their solutions
Bridging the limit of the dyad

- A critical point
  - Use outside the intended dyad
  - A “mestrings opplevelse”
  - Extends the functionality.
- Needs to be a standard technology
- Needs to be a demand
- Need interaction between the “innovators”
  - Similarly oriented people
  - Homophily
  - Social ties
Perception of critical mass by a linked individual

- Sees other who are directly connected
- Is subject to “suggestions” by the missionaries
- Has a central role
- People in this situation have an increased motivation
  - “Molecular” experiments
- Issues of
  - Social psychological conformity
  - Network externalities (economic)
Perceived critical mass
(social psychology)

• Motivation is driven by tendency to conform
  – Interdependent groups form norms that impinge on members
  – Two processes
    • Informational influence: information from other members is trustworthy and objective
    • Normative influence: Conformity to expectations to gain acceptance and approval

“Perceived critical mass creates the perception that most members of the group have adopted the technology. Potential users may feel that it is their obligation to use the technology and failing to do so may bring negative consequences.”

Source: Lou, Lou and Strong
Perceived critical mass
(economic)

• Network externality approach
  – Individual users benefit as the total number of users increases
  – Increasingly attractive as more users adopt
  – Adopters have the incentive to enlist more users

Source: Lou, Lou and Strong
Metcalf’s law and the value of connections

Network value (or usefulness) is proportional to the square of the number of users in the system

Source: Jerome Delacroix
Comparison of network valuation techniques

• There is the need for a network to grow above a certain level if individual users are to reap a benefit

• Beckstrom’s law
  – "The value of a network equals the net value added to each user’s transactions conducted through that network, summed over all users."

• Sarnoff’s law
  – "The value of a network is directly proportional to the number of users."

• Reed’s law
  – "The utility of a network can scale exponentially with the size of the network."

• Metcalf’s law
  – "The value of a network is proportional to the square of the number of users on the system."
Perceived critical mass in the context of TAM

Core nodes extend the bridging
• Can be because of innovative thinking
• Can be because of necessity
  o The London postal strike
• The perception of critical mass important for this adopter
• An ideology of adoption is important
**Interlinking of nodes**
- Increases the ability to link nodes and network functionality
- Individual choices result in social efficiency
- “Taken for granted” that others are users
- Reciprocity

**Structured role**
- Is used to the exclusion of previous systems
- The economies of previous systems suffer
- Previous systems may not be maintained
Pressure to adopt

- Key people (nodes) can hinder adoption
- Needs to develop a counter ideology to avoid adoption
  - Based on a broad principle
  - Can be founded on regulation and rules
  - Needs to cultivate illustrations
Filling a network hole

Network entrepreneurs

Filling a network hole
Revised critical mass

• The role of the enthusiastic hobbyists/tinkerer
  – Can be the missionary pushing the technology
  – Different roles for people at different points
  – The innovator, legitimator, cautious follower, luddite, etc.

• Homophily and social ties play an important role
  – The study of “molecular infection” shows the impact of social ties

• Need for standardization with communication (and other types of) technology
  – Clocks with the number of hours, etc.
  – Will it be GSM, CDMA or some other standard?
Revised critical mass

• Eventual role of public (or publically available) infrastructure
  – Physical infrastructure
  – Regulatory structures
• Financial muscle needs to be in place
  – People who are willing to venture capital
• Commercial actors need to touting the technologies
• Stability of the broader social situation
Conclusion

• Perception of critical mass effects is important with social mediation technologies
• Conditions push (coerce) people to use the interaction form
• As the density of the network increases, users can begin to assume that others are also users.
• When people believe that a mediation form is universal, their belief is real in its consequences