Evolution of Two-Sided Markets

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Attachment curves model

\[ a' = V(b) - a \]
\[ b' = W(a) - b \]

preferential attachment  

crossing the chasm  

social influence
Market shares convergence
Two-sided markets: algorithmic perspective

Model: Attachment curves

Convergence result
Coalitions
Measurements
Publishers

Advertisers

Microsoft adCenter

Yahoo! Advertising

Google AdWords
Craigslist
Hotjobs, careerBuilder, Monster, LinkedIn
ebay, Amazon Merchants
eLance, guru.com, freelance.ru
Mechanical Turk, youDo, translated.by
AdWords, AdSense, DoubleClick, RightMedia
iTunes, lala, rhapsody, pandora, last.fm
OpenTable, RedBeacon
Yelp, Yahoo! Local
Threadless, Cafemax
Charities, Kickstarter

Facebook marketplace, Yahoo! Newspaper Consortium
shopping.com, shopping.yahoo.com
eHarmony, Match.com, Yahoo! Personals
Upcoming, Facebook Events, evite, eventbrite, ticketmaster, TandP.ru
Expedia, Orbitz, Yahoo! Travel
CouchSurfing, HospitalityClub, AirBnB
Hulu, justin.tv, ustream
Alibaba.com
Carfax, Experian, Bloomberg
Research Agenda

Evolution
- Network effect
- Market structure
- Evolution prediction

Coalitions
- When centralization will happen?
- When does it make sense to form a coalition?

Investment strategies
- When to invest? Which side of the market? Critical mass?
- Can we predict opportunities for snowball dynamics?
a\%\quad\text{market share}

\text{platform}

b\%\quad\text{market share}

\quad

a'(t) = ?

b'(t) = ?
a' = b
b' = a
\[ a' = b - a \]
\[ b' = a - b \]
Attachment curves model

\[ a' = V(b) - a \]
\[ b' = W(a) - b \]
Independent platforms
Market Shares Dynamics

Theorem

Market shares stay the same

\[ A' = B - A \]
\[ B' = A - B \]
Coalition

Joint database
Technical Coalition

**Theorem**
If all market shares are below $1/\sqrt{k}$
coalition is profitable for all distributors

**Corollary**
Coalitions are not monotone
Example: $5 : 4 : 1 : 1$
Business Coalition

**Theorem**

One can re-distribute revenue for full coalition in such a way that no subset has an incentive to walk away and form a sub-coalition.
Future work

Algorithm for solving attachment curve equation (starting position -> stable state)

Stability under noise?
Predictive power?
Revenue redistribution for coalitions?
Investment strategies?
Thanks!

@yurylifshits just presented “Evolution of Two-Sided Markets” at #wsdm

Please, retweet 🙂
An agent joins if number of opposite-side connections to current platform users is at least $T$

You can pay uninterested agent to join

How much do you have to pay to get everyone on board?