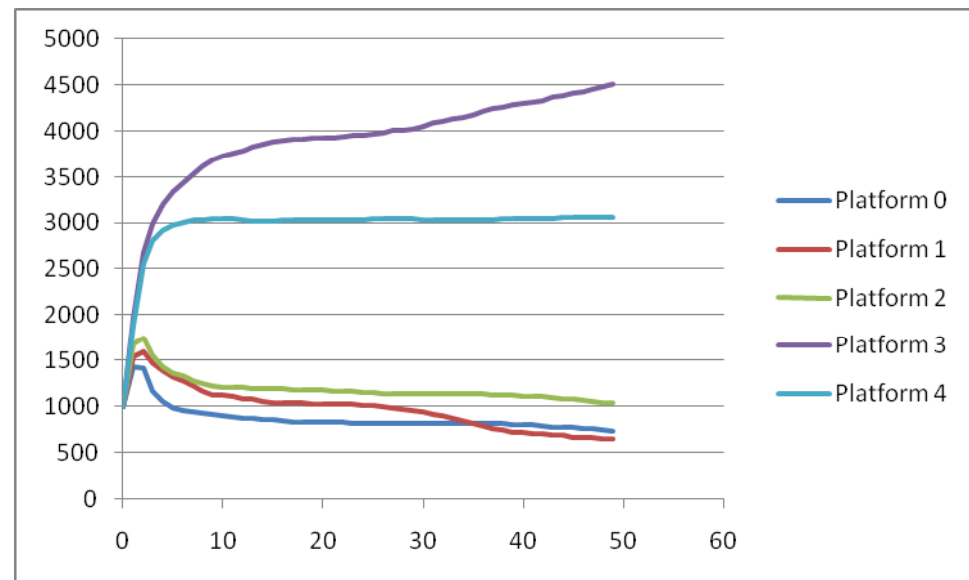


Social Networking Platform Competition Simulation

i290-7

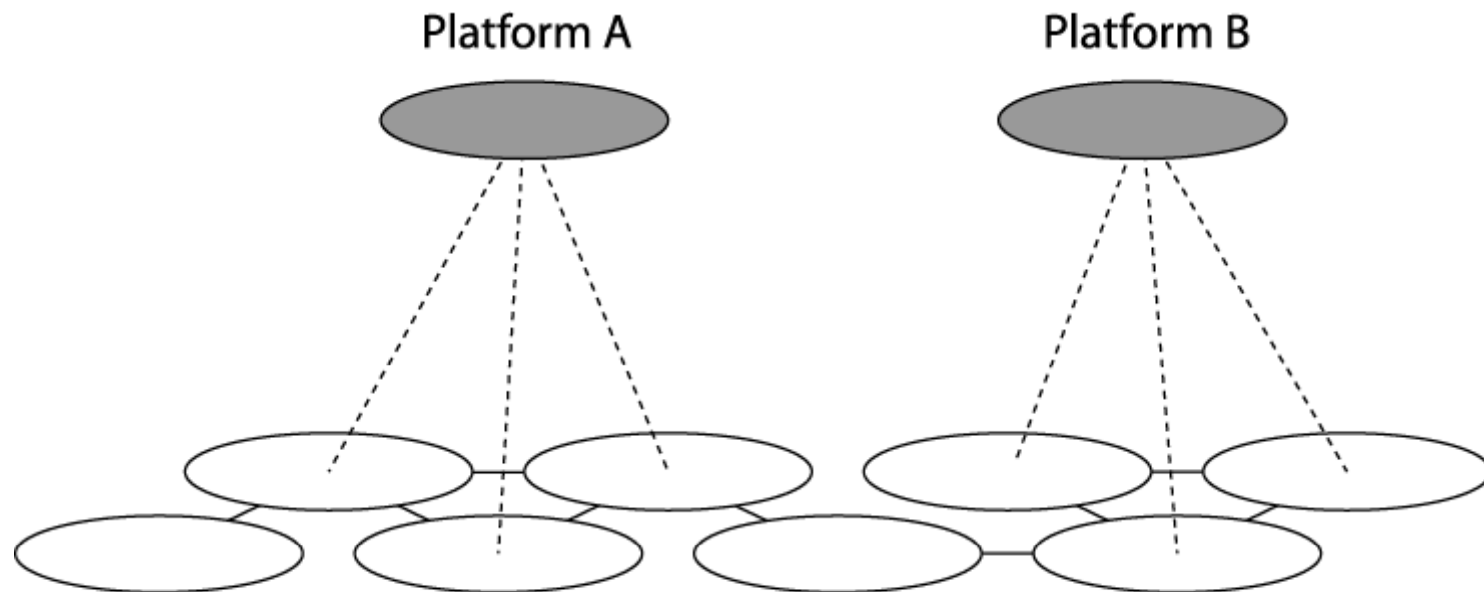
Fall 2008

Hyunwoo Park



Simulation Overview

Given social personal relationship network,
competitions among social platforms
was simulated.

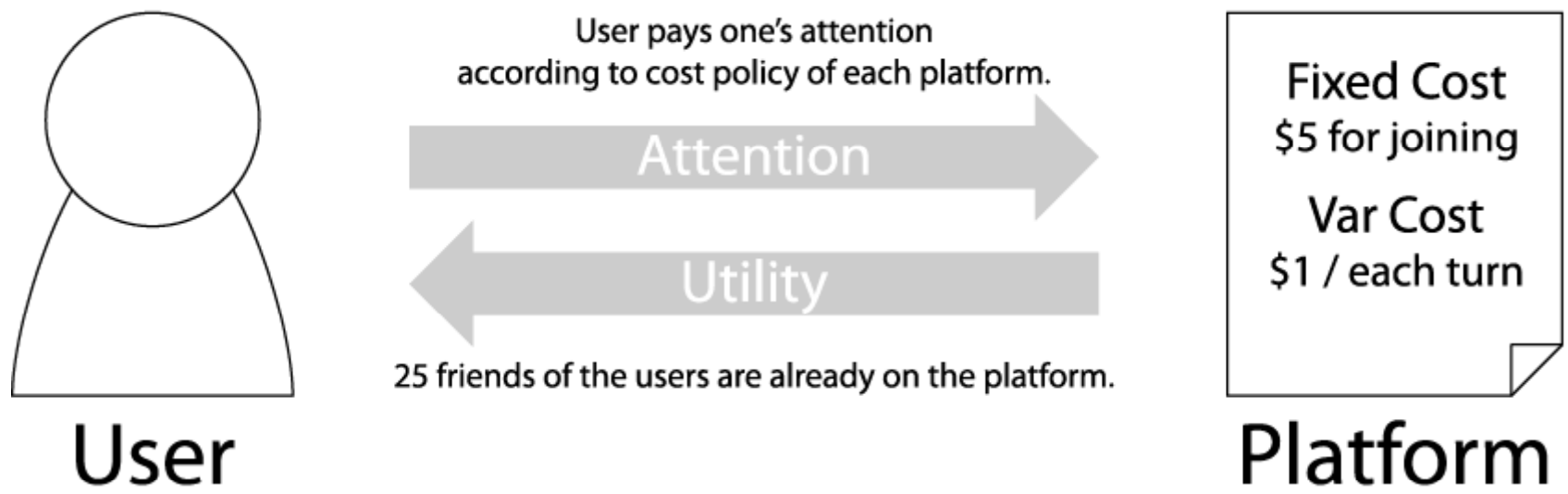


N (# of agents) used for the simulation was 10,000.

Agent = **You**

Mechanism

The basic underlying assumption is that people pay their attention as a sort of money to platforms, and platforms have different rules for setting how much each user should pay.



In return, each user will obtain utility calculated based on how many friends of the user are on the same platform.

Given Networks

I used five types of network topology:
three are theoretically generated topology, each of which shows different characteristics,
two are real social network topology, facebook and twitter.

Theoretic Topology

Waxman Model

: Just random network

Barabasi-Albert

: Modeling incrementally growing network

Small World Topology

: Modeling topology of the Internet

I coded topology generator for Small World topology by myself, so I cannot trust the data yet. :(

Real World Topology

Facebook

: Social Networking Site



Even Mark Zuckerberg is included in the network.

Twitter

: Social Alerting System(?)



Thank you, Ben and James. You were seeds for crawling. :)

Ironically, I collected friends network DB by crawling their DB using their API.

Factors on Competition

There are several factors that could affect the simulated competition.
The followings are what have been implemented for the simulation tool so far.

■ Multiple Sign-up Allowance

Is each agent allowed to belong to multiple platforms at the same time?

■ Sequence of Entrance to Competition

When does each platform start to enter the competition?

■ Initial Stakes of Each Platform

How many users does each platform have at the time of joining the competition?

■ Locality of Initial Stakes

How are the initial members distributed?
Randomly or locally?

of Platforms

Ratio of Fixed/Var Costs

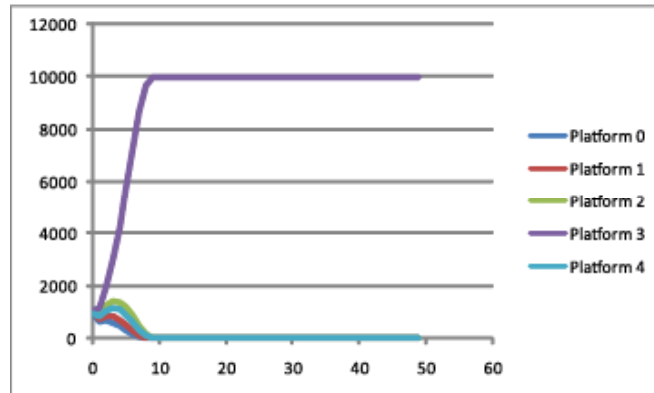
And so on...

*(There should be much more factors that could possibly affect the results.
I am thinking of developing this tool over the Winter break.)*

Finding: Topology

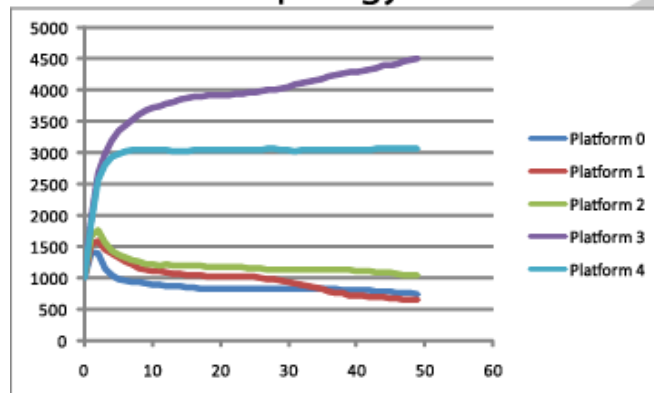
Clusters in network topologies modeling real world networks seem to prevent the winner-takes-all phenomenon called “network effect.”

Waxman (Random Network)

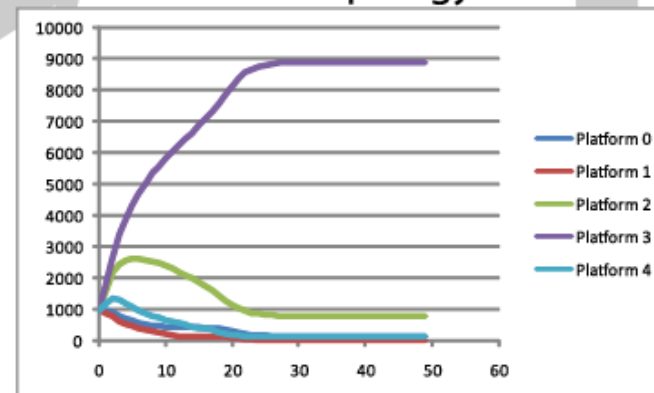


In the random network, losers take nothing. (Y-axis is number of members. You might remember that total # of nodes is 10,000.)

Small World Topology



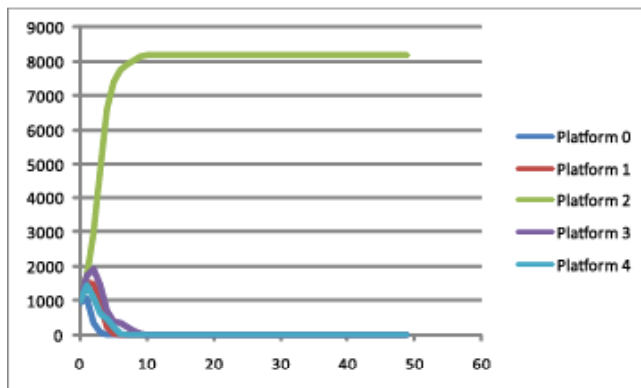
Barabasi-Albert Topology



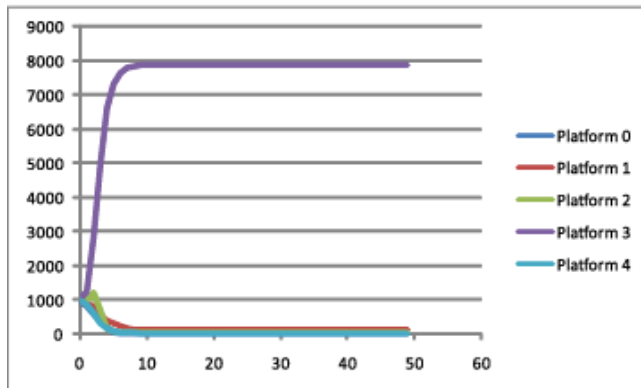
In the topologies below, losers can still have their own stake, even though there is a clear winner.

Finding: Topology

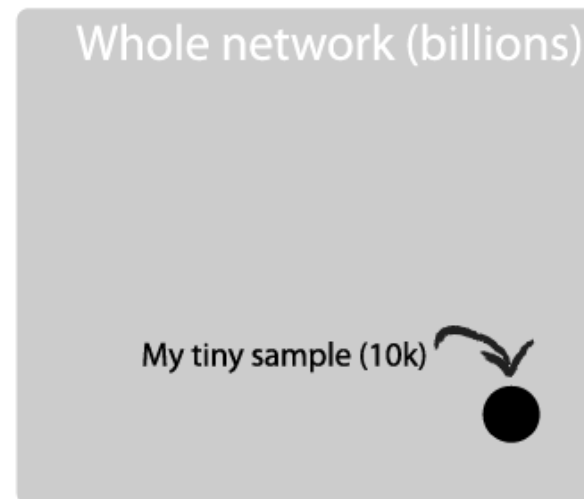
Unfortunately, the “real” networks did not show such a characteristic. I suspect that this is because facebook and twitter networks are much denser than theoretically generated topologies since they are just a tiny part of the whole network.



Facebook



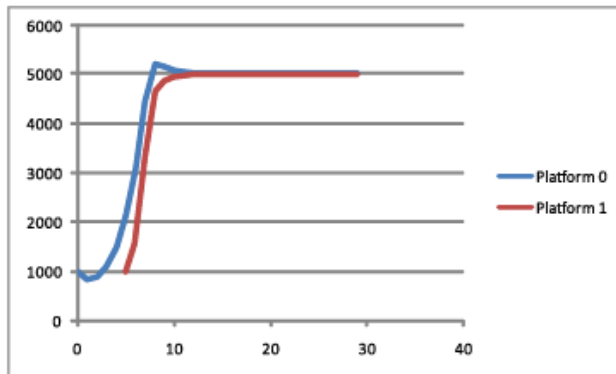
Twitter



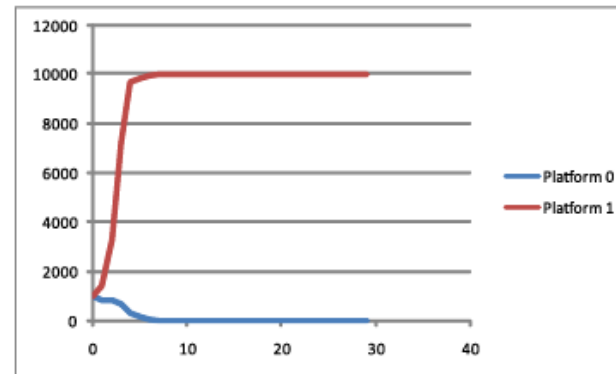
Finding: First Mover's Advantage

First mover seems to be able to charge about 15%~20% higher costs to users.

Time delay = 5 (unit)



No time delay



Fixed Cost
50 for joining
Var Cost
15 each turn

Platform 0

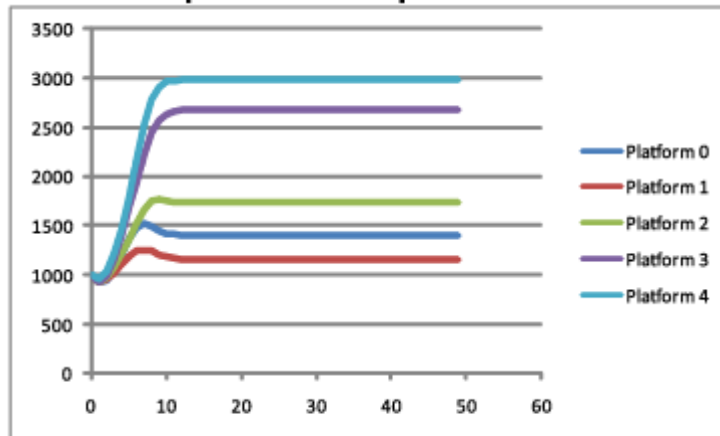
Fixed Cost
42 for joining
Var Cost
12.6 each turn

Platform 1

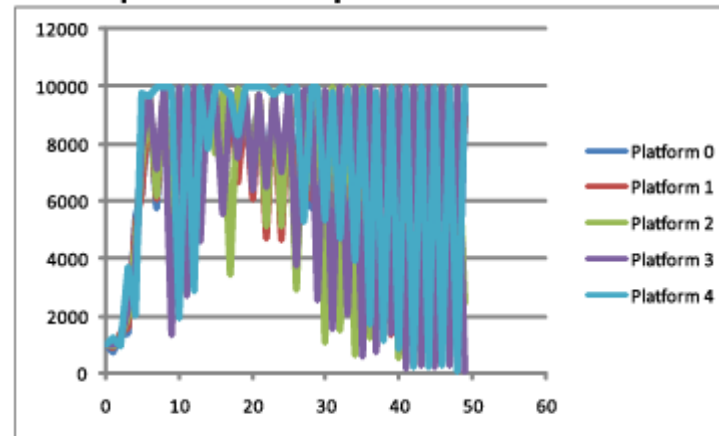
Finding: Effect of Allowing Multiple Subscription

I gave up trying to interpret these data.
This should be either a bug or a very interesting oscillating phenomenon.

No multiple subscription



Multiple subscription allowed

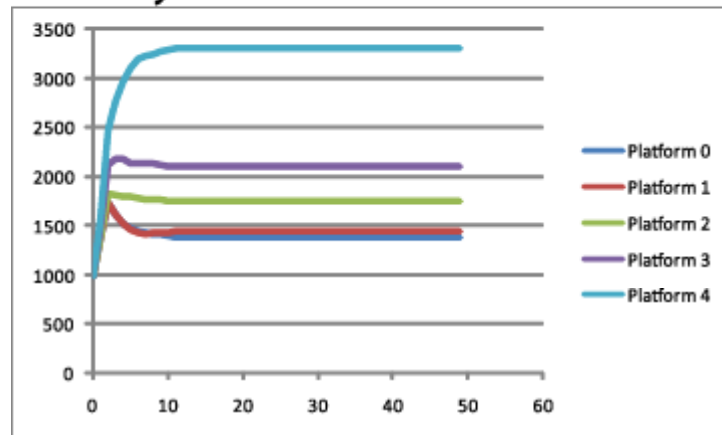


All five platform profiles are identical.

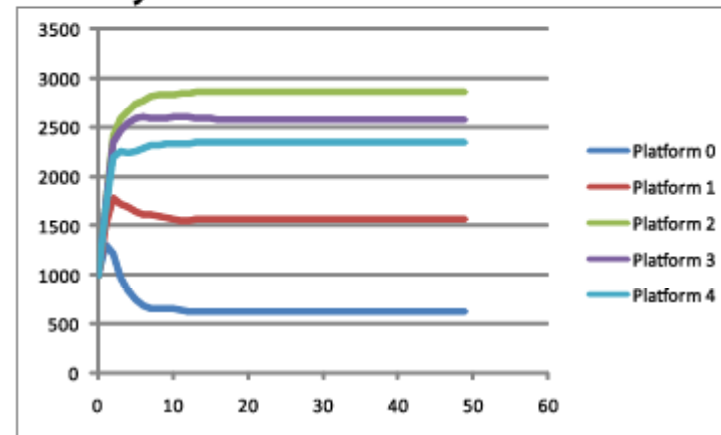
Finding: Locality of Initial Stakes (1/2)

Starting with locally concentrated user base is superior to starting with globally distributed user base.

Globally distributed

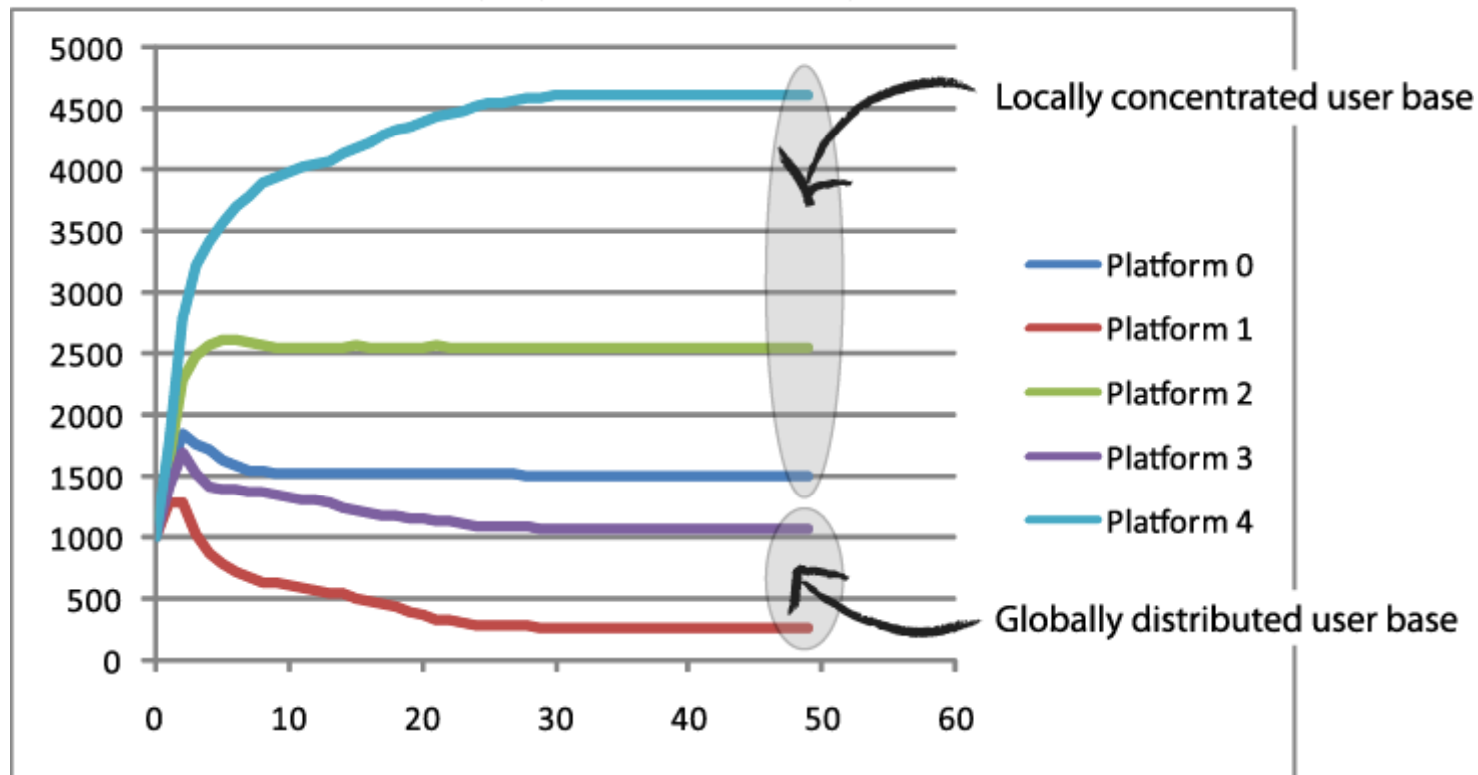


Locally concentrated



Finding: Locality of Initial Stakes (2/2)

Mixed (Platform 0, 2, 4: Local / 1, 3: Global)



Limitations & Future Work

Here are some limitations for the work and ideas for future works.

■ Are your arguments “statistically” valid?

No. I just extracted patterns observing by myself as a pattern recognizer.
I am thinking of studying some statistics to make a valid argument from this simulation.

■ What’s difference between the given friendship and friendship via platforms

I just assumed that given personal network such as family members or classmates
is distinguished from the relationship made through social networking platforms. My bad.

■ You didn’t explain enough about “why.”

Since I am not a network expert yet, I have to study some academic materials
related to network to understand and explain the underlying principle beneath the phenomenon.

■ How about visualizing simulation process?

Yes. That would be definitely a cool stuff if I create a dynamic visualization of the simulation.
Coming soon. (I am not sure, though. ;))