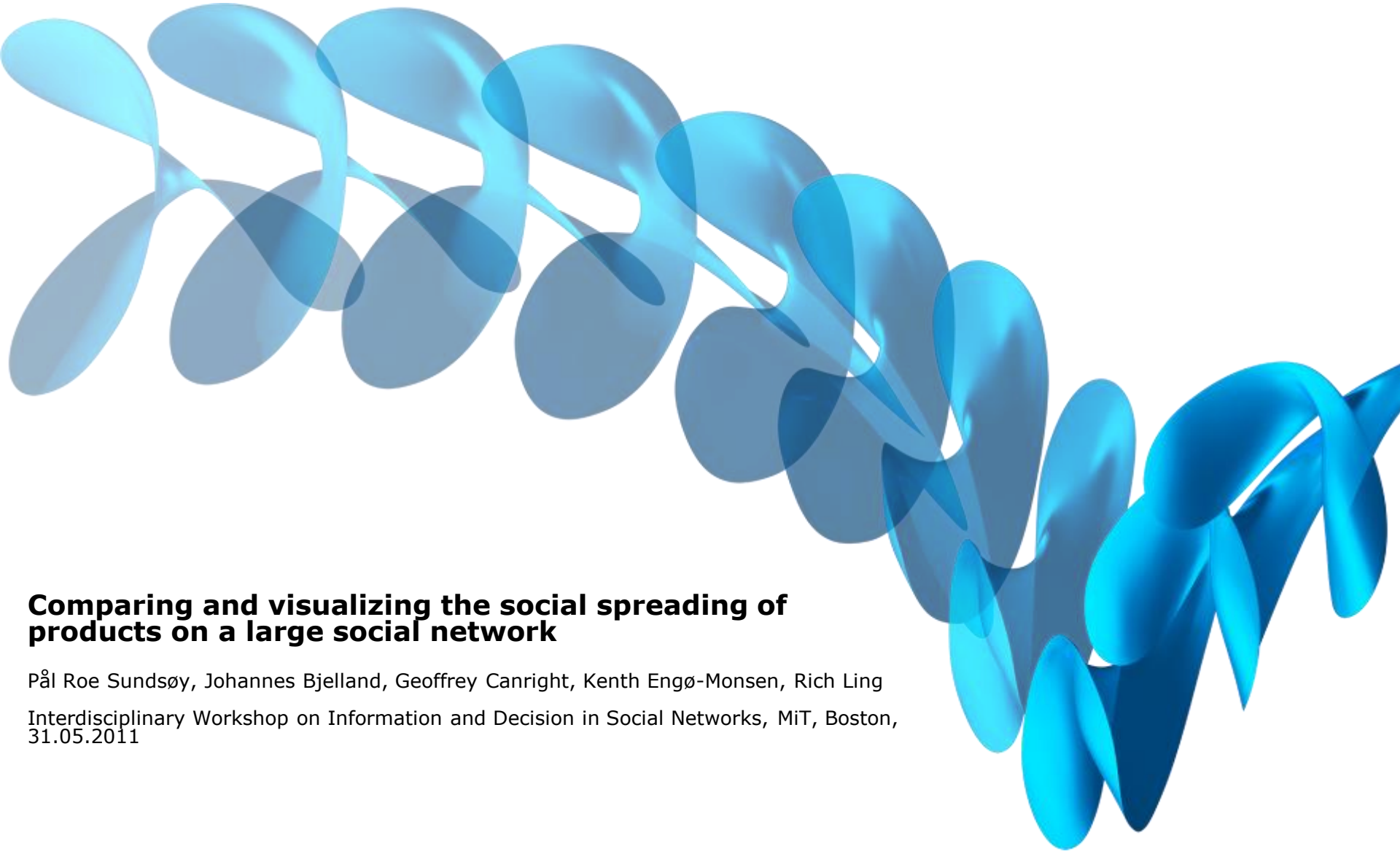

Comparing and visualizing the social spreading of products on a large social network

Pål Roe Sundsøy, Johannes Bjelland, Geoffrey Canright, Kenth Engø-Monsen, Rich Ling

Interdisciplinary Workshop on Information and Decision in Social Networks, MiT, Boston, 31.05.2011

Agenda

1. Motivation
2. Method
3. Definition and the evolution of adoption networks
4. The social adoption coefficient κ
6. Summary

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Motivation

How does the underlying **structure** of a **empirical** social network among **adopters** develop over time?
How does it **vary** with different products?

- Today network data are available through:
  - **Electronic phone logs (CDR=Call detail records)**
  - Social network services (linkedIn, facebook, myspace,IM etc)

- We know that social network matters when **purchase decisions** are made and people are **churning**.

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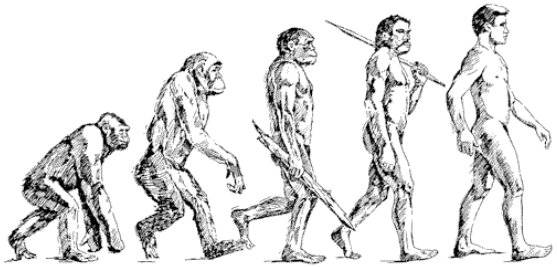
Our Study

In this study we present a empirical and comparative study of how product diffusion occurs over time in a telecom market with millions of phone users



Focusing on four products:

Apple iPhone

"This changes everything"
"Highly buzzed"
"Great internet experience and design!"

Apple iPad

"People laughed at us for using the word magical. But you know what? It turned out to be magical"

Doro

"Great for older people"
"Mobile phones that you can make phone calls with"

Mobile Video Telephony

"Requires 3G phone and 3G coverage"
"Brings people closer together"

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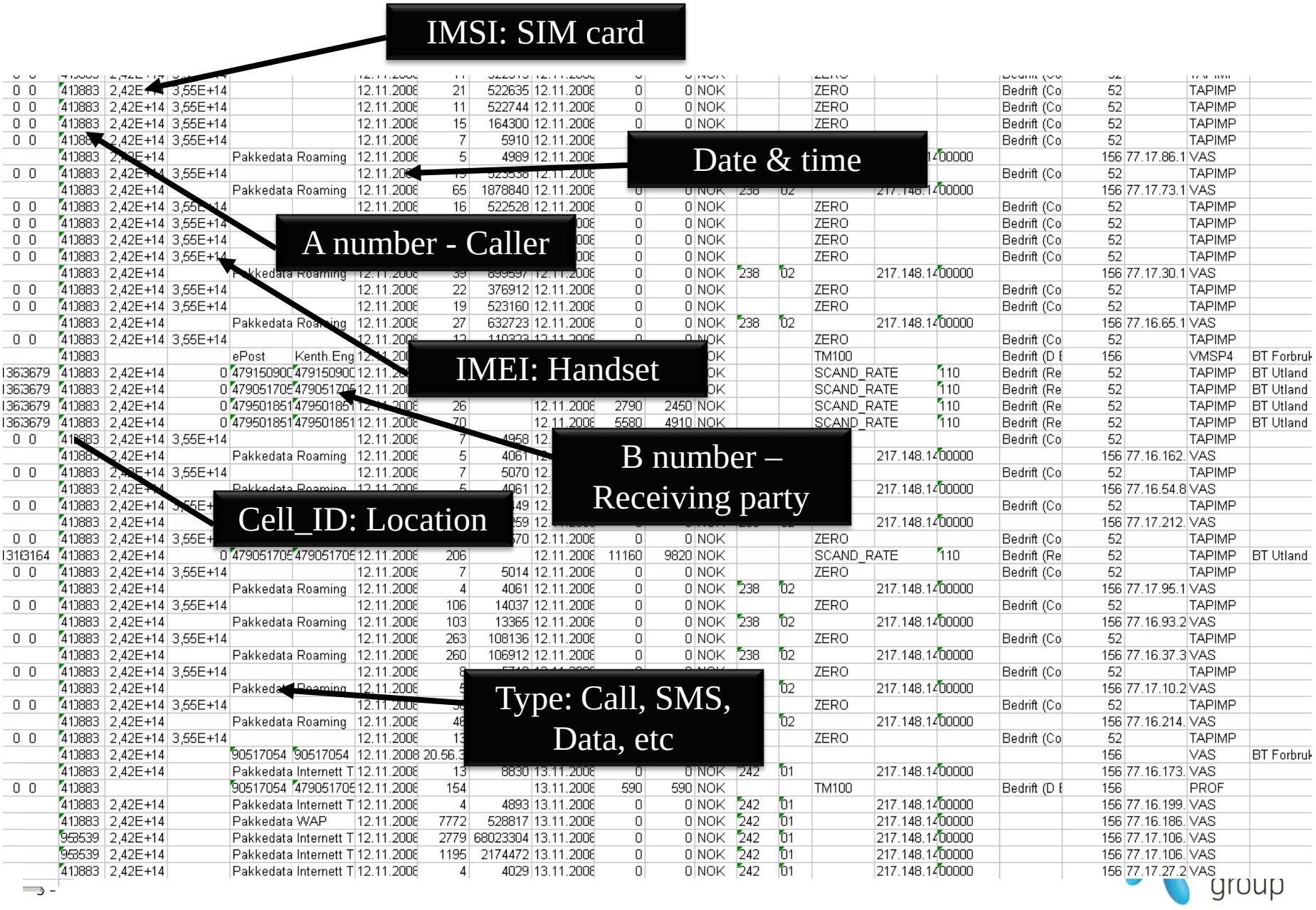
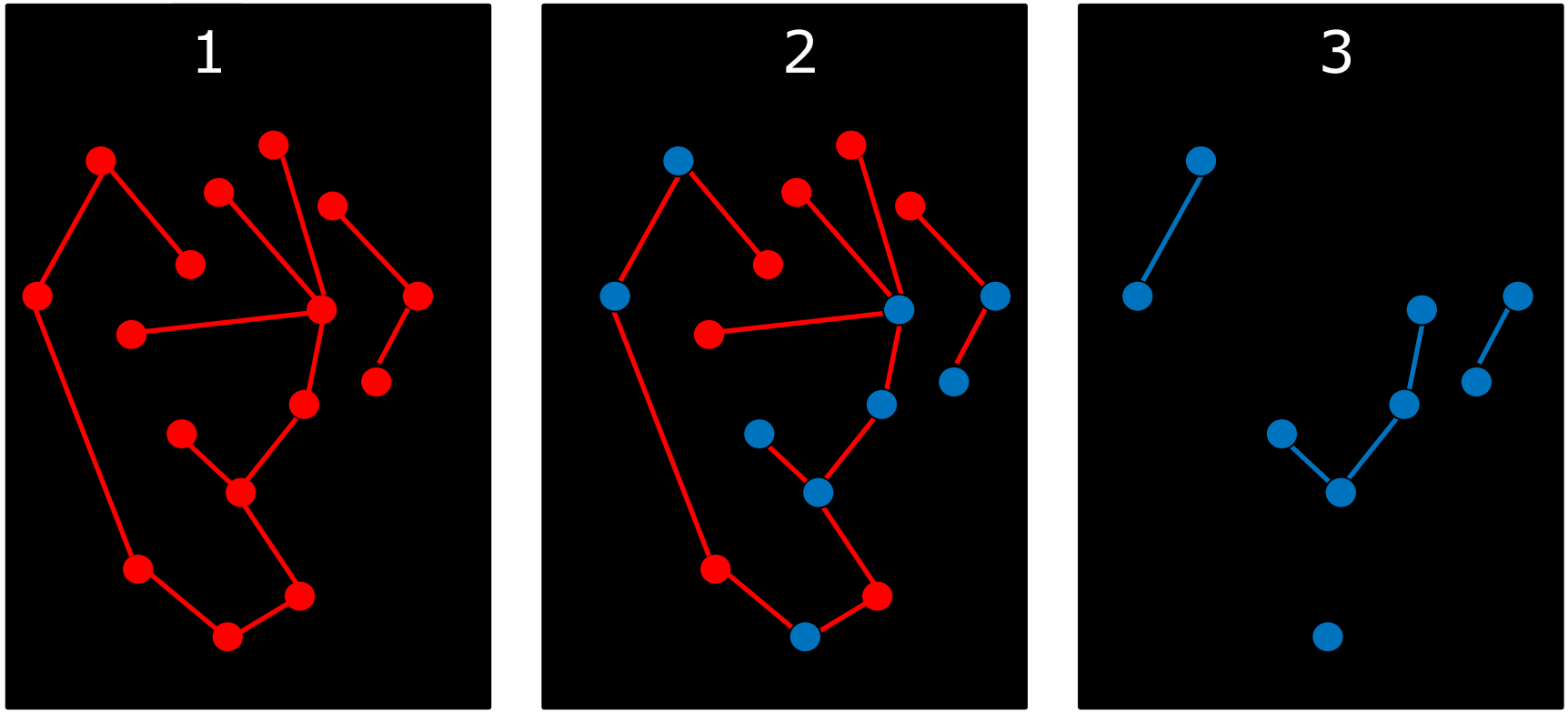
Raw CDR data—our starting point



It is practical to define the adoption network



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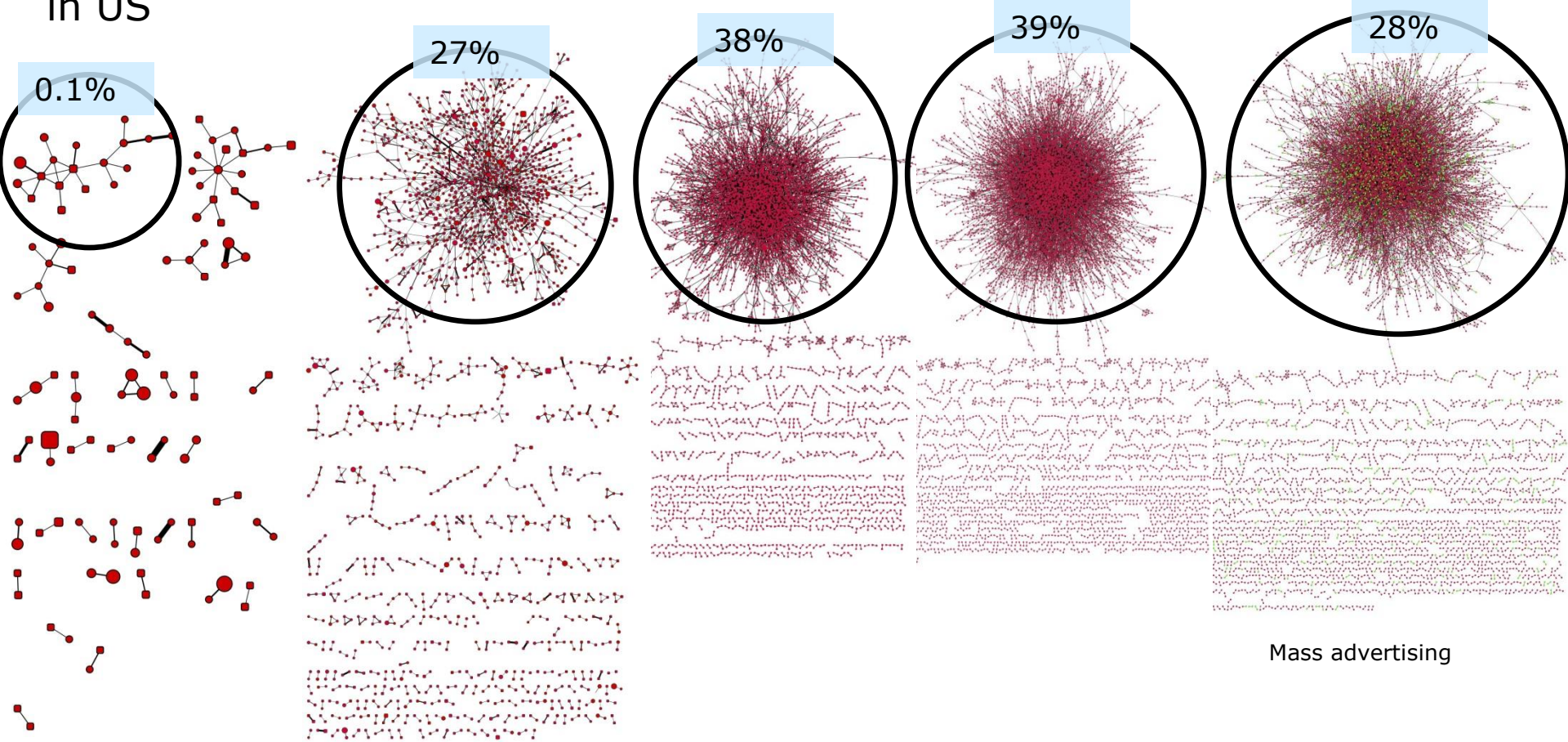
The iPhone adoption network evolution

Q307 **Q407** **Q108** **Q208** **Q308**

2G release in US

3G release



NI: 18%%

iPhone not yet available in specific market:
"Cracked iPhones" bought in the US.
Much traffic in US

NI: 45%

NI: 52%

NI: 50%

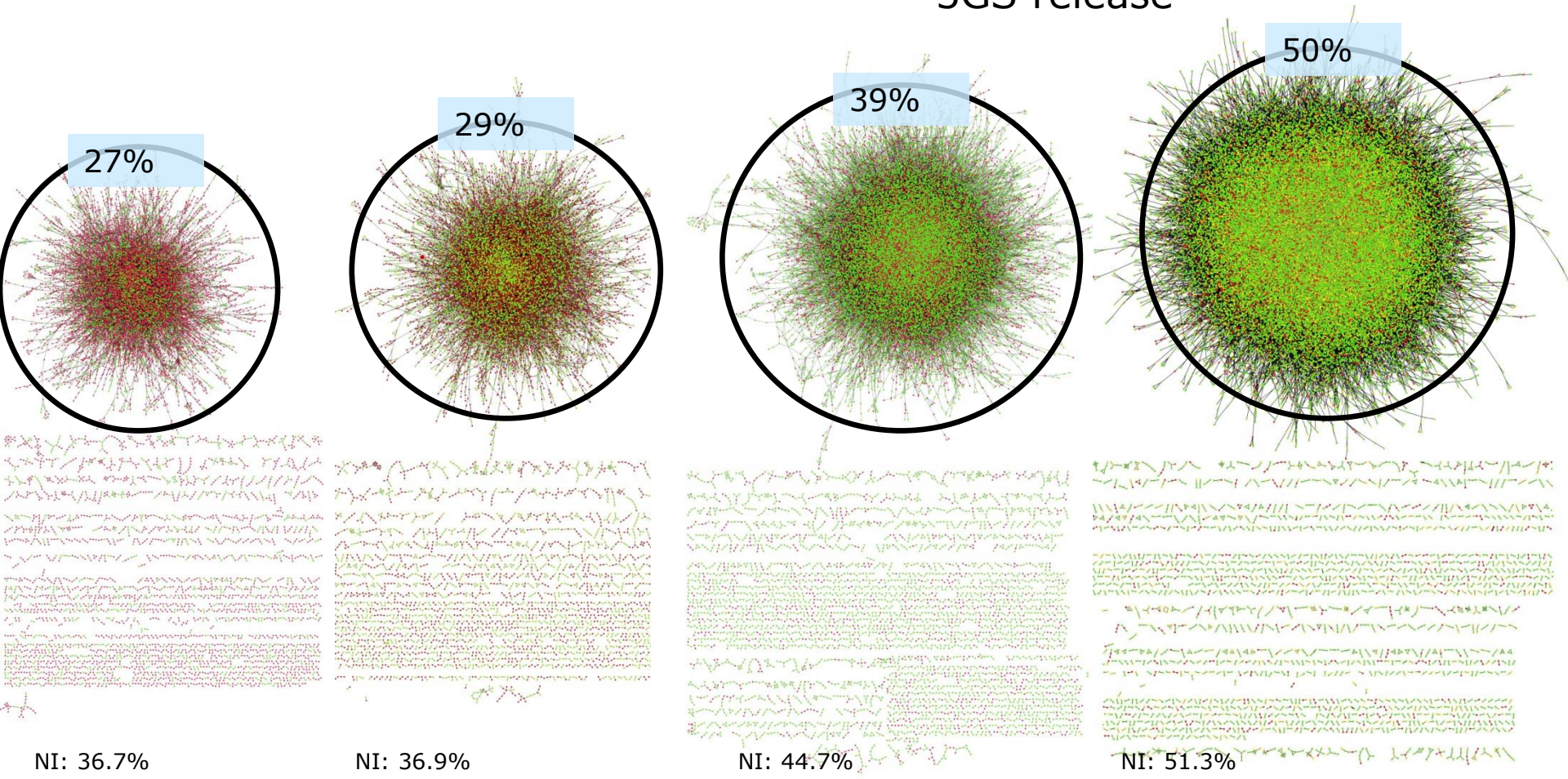
NI: 37%

2G 3G 3GS

The iPhone adoption network evolution

Q408 **Q109** **Q209** **Q309**

3GS release



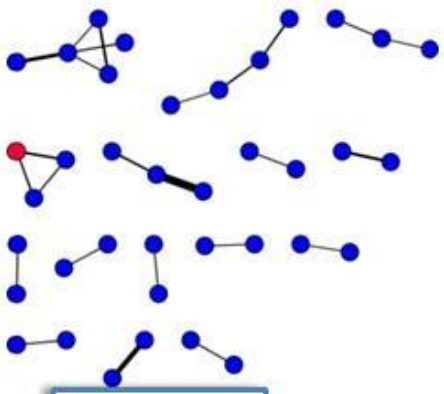
2G 3G 3GS

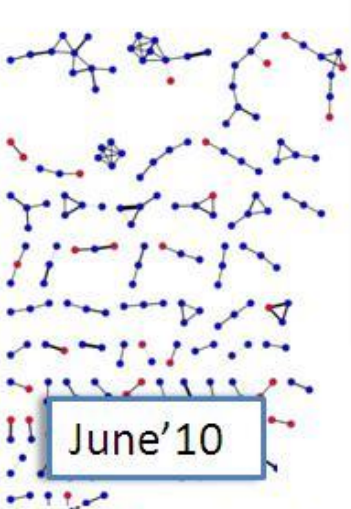
iPad 3G

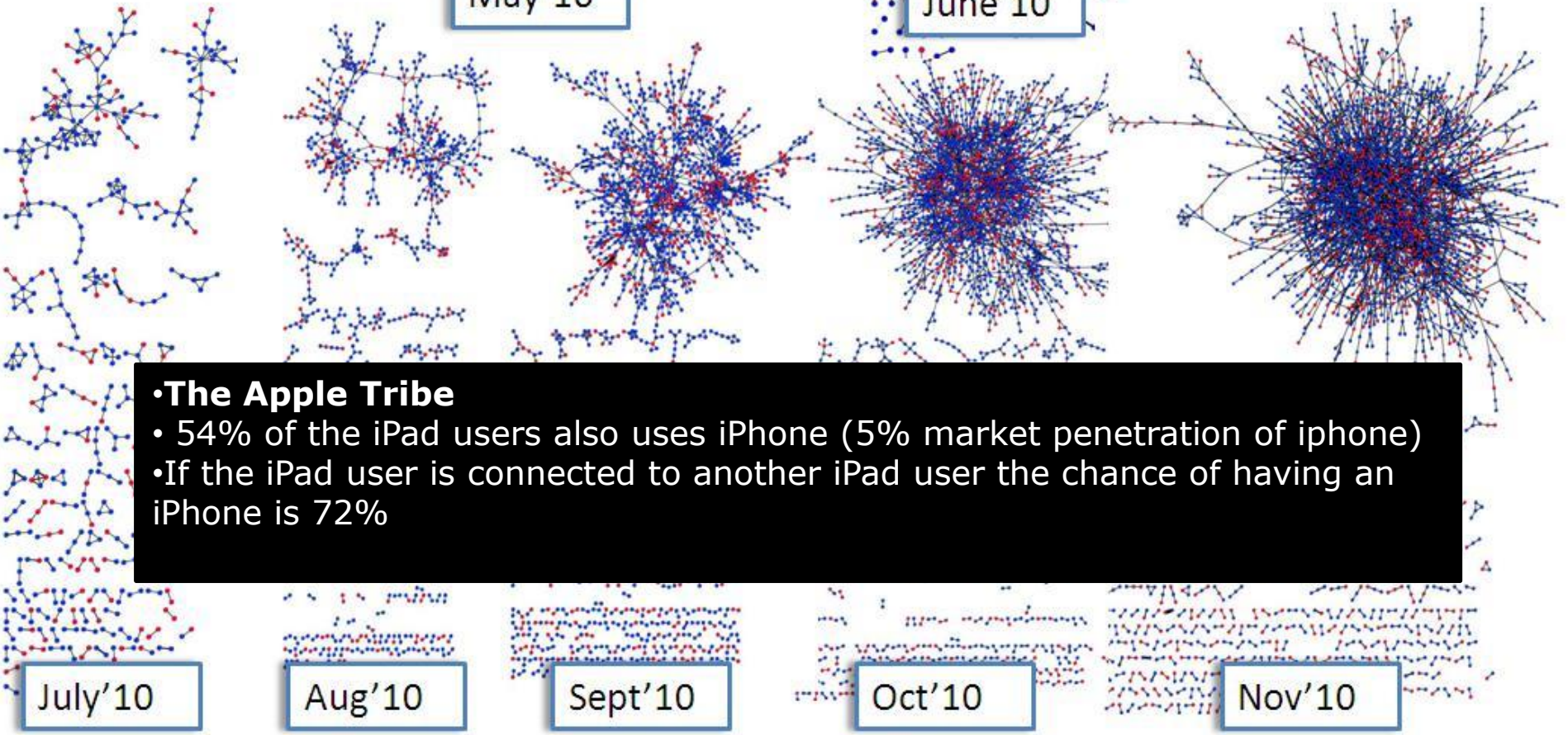
=iPad user with iPhone

=iPad user with other handset

Links are social relations based on *SMS+Voice*







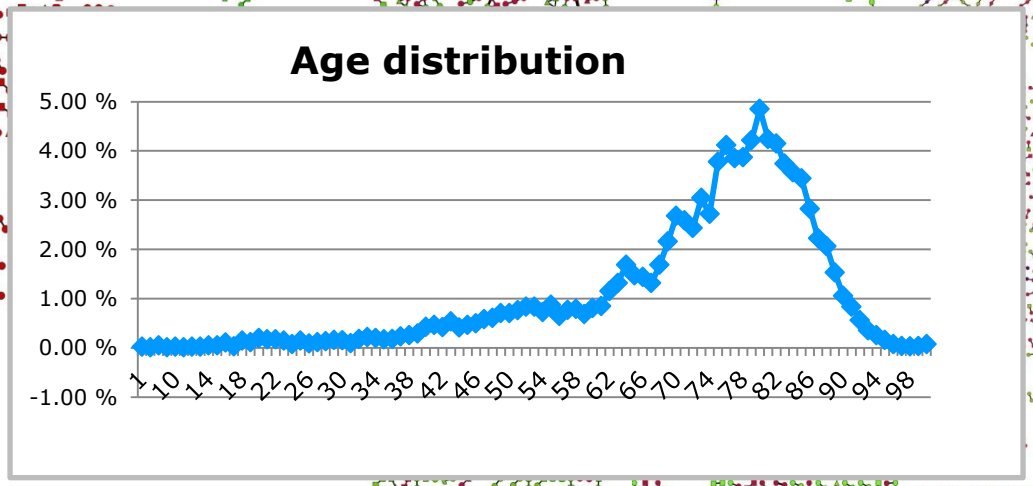
•The Apple Tribe

• 54% of the iPad users also uses iPhone (5% market penetration of iphone)

•If the iPad user is connected to another iPad user the chance of having an iPhone is 72%

The DORO adoption network evolution

Q407 | Q108 | Q208 | Q308 | Q408 | Q109 | Q209 | Q309



Non-Isolates
3.5% 4% 4% 4.9% 5.1% 6% 6.8% 10%

Adoption of Doro, an individual choice?
Or The choice of the user's children who wish to be in contact with their elderly parents?

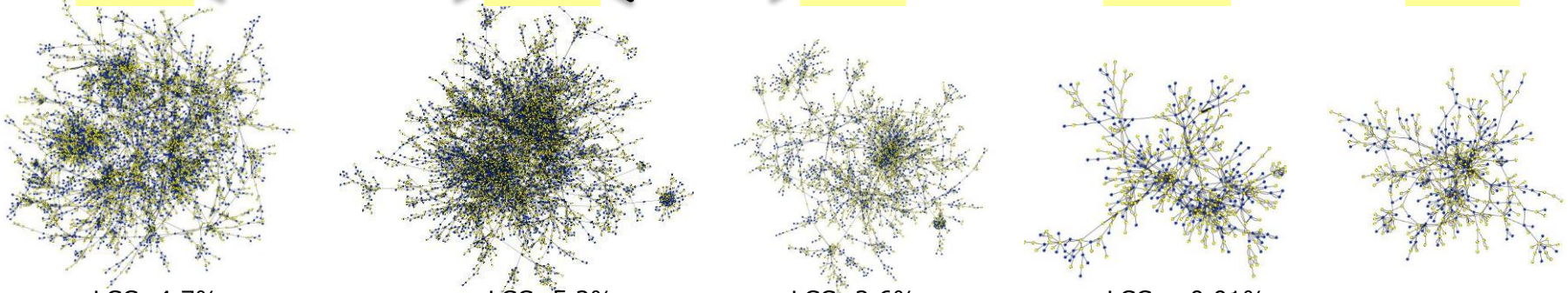
Doro HandleEasy 326,328
Doro HandleEasy 330
Doro PhoneEasy 410
Other Doro (338,345,409)
Age: <25 25-55 55-70 >70

The Mobile Video Telephony network evolution

Increased # of adopters in LCC

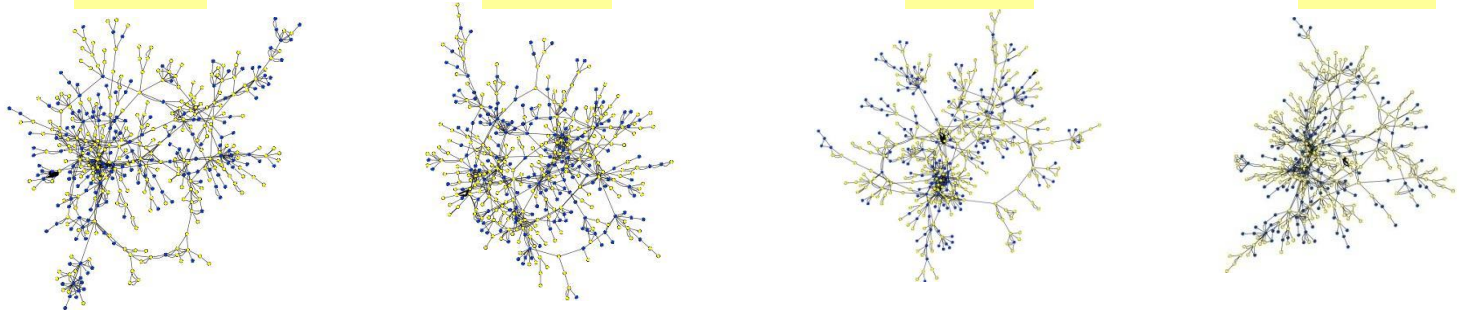
Collapse of LCC

Q307 **Q407** **Q108** **Q208** **Q308**



LCC: 4.7% LCC: 5.2% LCC: 2.6% LCC: <0.01%

Q408 **Q109** **Q209** **Q309**



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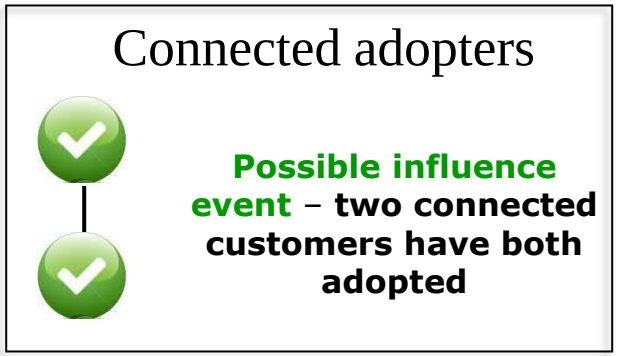
K-test: We look for adoption pairs/links

•Do connected people adopt more often together than chance would predict?

•A highly viral product will have many influence links in the adoption network



$$K = \frac{\#\text{ connected adopters)}}{(\#\text{ expected connected adopters})}$$

A model simulating random adoption among our subscribers

Strong social spreading effects ➔ κ -> 1
Random adoption ➔ κ = 1

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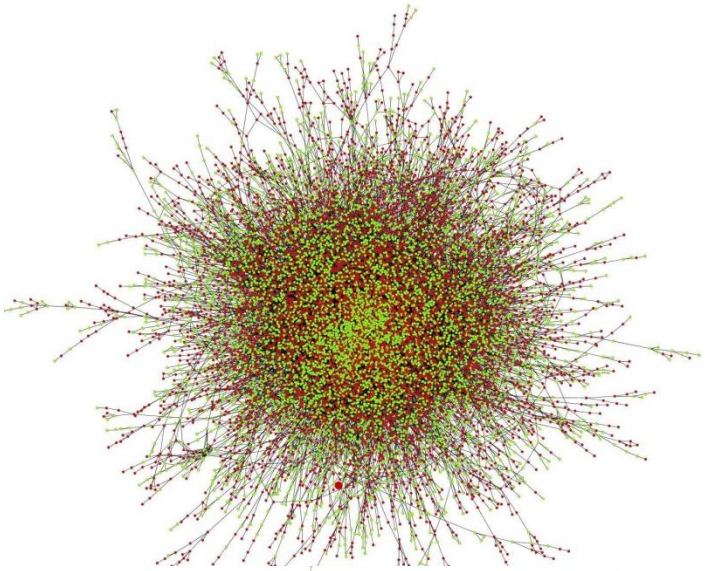
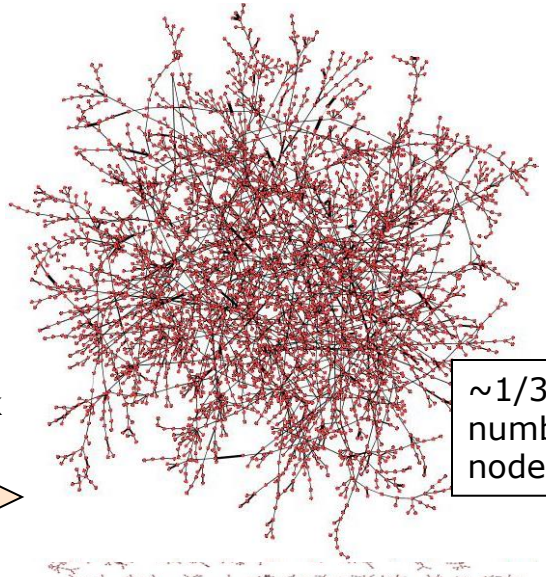
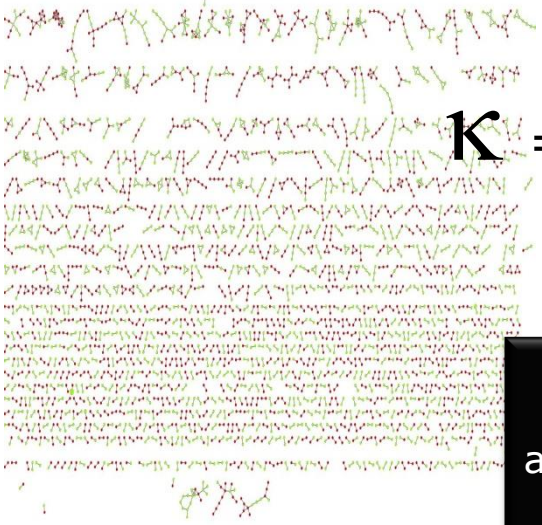
iPhone adopter-pairs are over represented in the empirical data



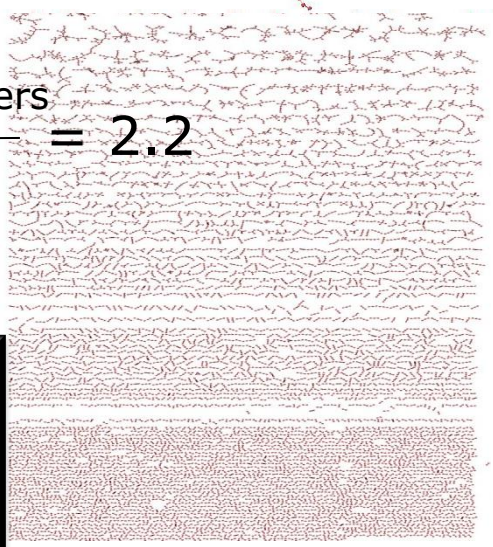
Shuffle the 47813 nodes from the empirical network randomly over the whole social network



~1/3 the number of nodes in core



$$\kappa = \frac{\text{24 879 connected adopters}}{\text{11 412 expected connected adopters}} = 2.2$$



People who talk together adopt together much more often than chance would predict

Empirical network

Random network

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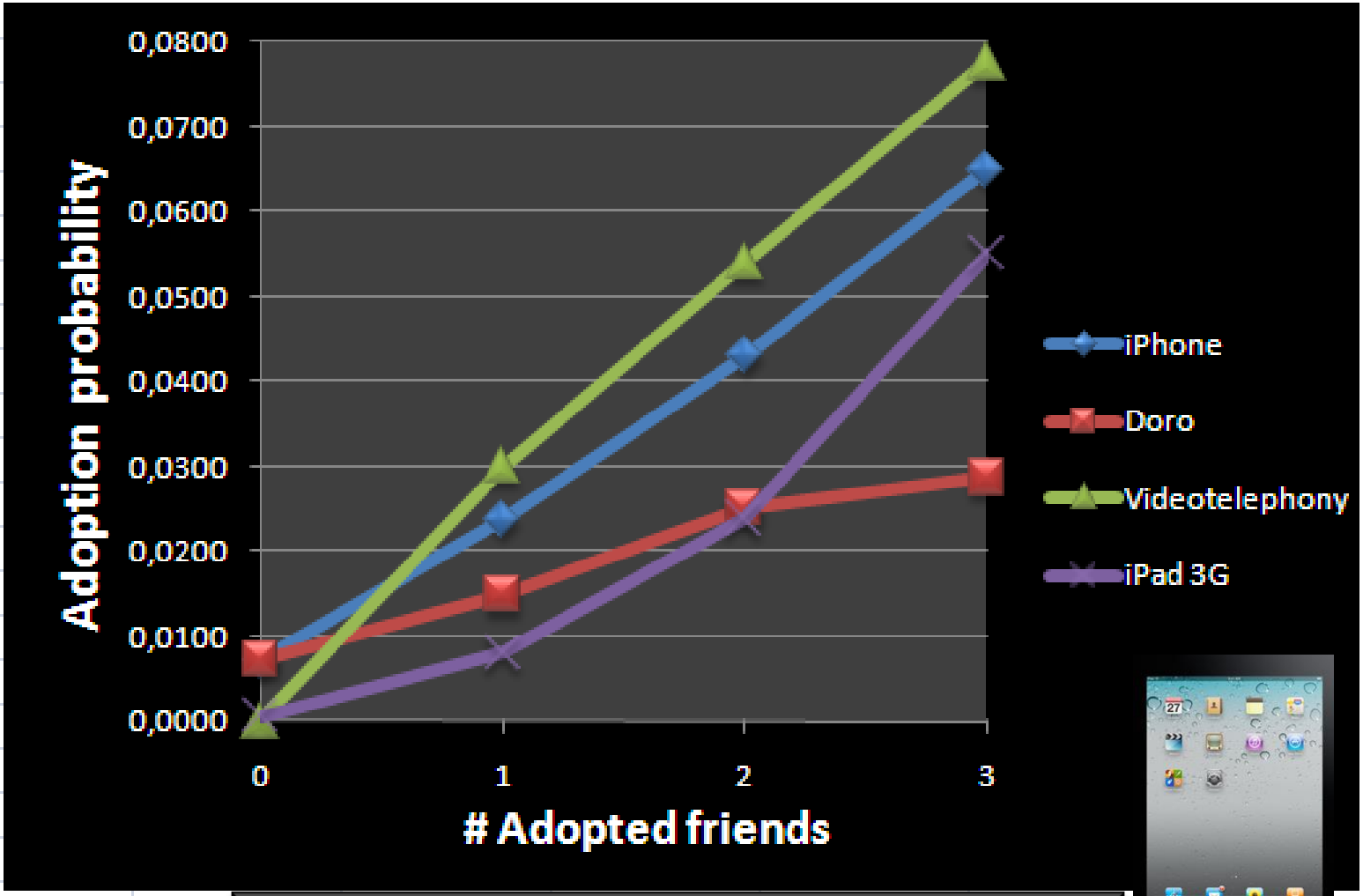
You do what your **friends** do



If you have one friend with iPad, your propensity to also buy iPad will be **14** times higher.

Exploit the social circle to target customers with high social product pressure

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- Summing up -

•The iPhone and iPad has very strong social spreading effects, and has truly taken off

- LCC grows monotonically in absolute values, while it has percentwise variation at the expense of isolates
- Communicating iphone users are adopting together (κ–test)

•The Doro handsets have only very weak social spreading effects. This device will probably never take off in the same sense as the iPhone

- LCC has not much variation with time
- Dominance of isolates (>90%)
- Communicating subscribers are usually not adopting together (κ–test)

•Video Telephony started spreading very strongly, however its early takeoff was stopped by a new price model

• Empirical data shows that the time evolution of the structure of the adoption network is very different for various mobile products.

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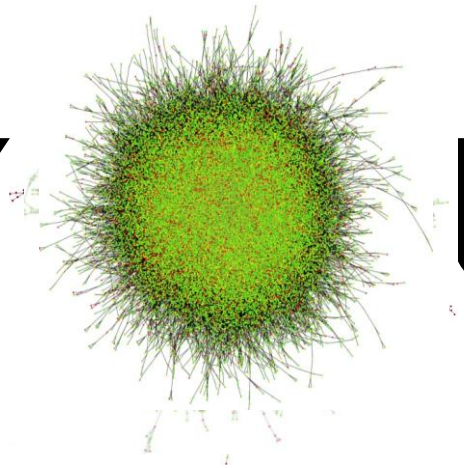
THANK

Y  U!

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