

Applications of decentralized location-bound networking

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Literature Study

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Primary Research

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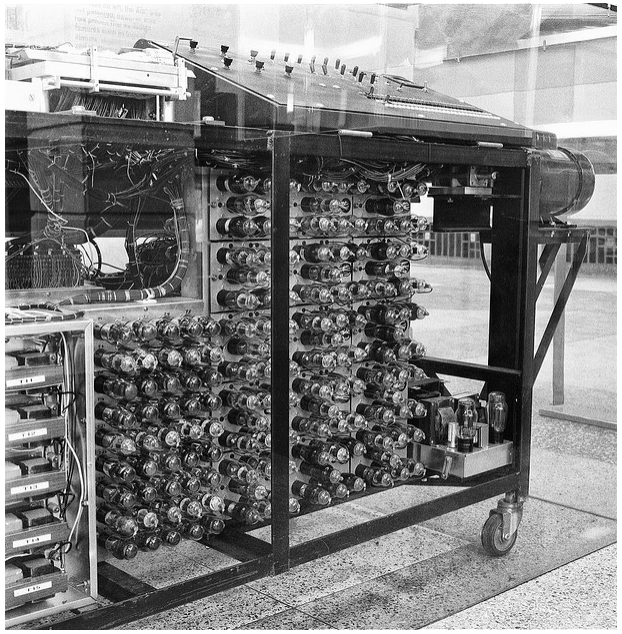
Prototype & Scenario

Testing

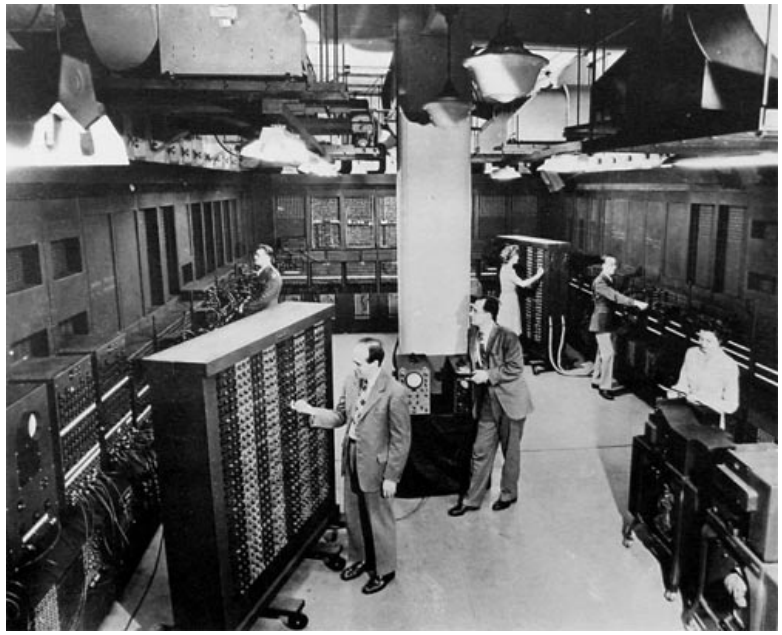
Conclusion

Conclusion & References









Initial Brief

Tools which enable users to create location-bound networks through p2p connectivity and use them for situational needs in the Indian context

- not to restrict its application to being just a free communication channel

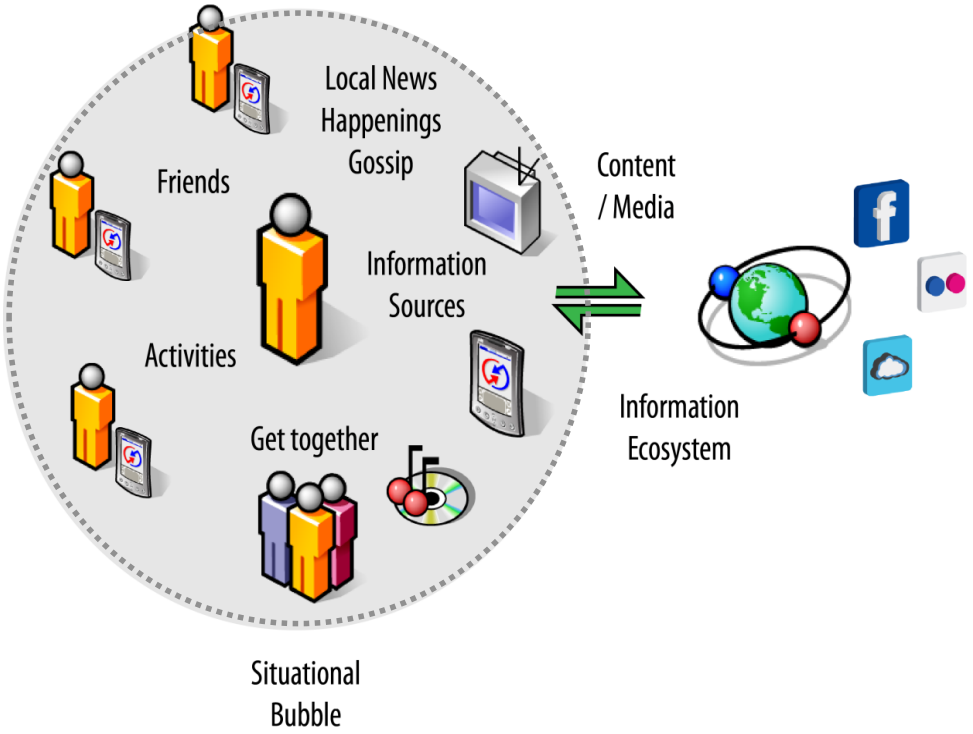
-also look at greater possibilities of location-specific networking such as wayfinding, local advertisements, small-scale enterprises, finding specific people within a space, media exchange, etc.

- It is a dispersed, local and democratic network

- Content evolves automatically as changes occur in the environment

- Immense scope of data Aggregation and location-specific analytics for critical insights

- Possibility of ad-hoc networking (traffic jams, hostel, party, etc)



Literature Study

pptPlex Section Divider

The slides after this divider will be grouped into a section and given the label you type above. Feel free to move this slide to any position in the deck.

Literature Review

Mobile Ad-hoc Networks (MANETs)

MANETs are justified by the possibility of building a network where no infrastructure exists, or to have a “free” network where users can communicate without cost (provided that the node density is sufficient)

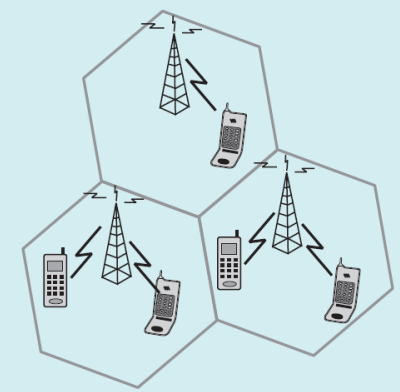
Commonization of MANET is essentially the precursor to ubiquitous computing

Been a hugely popular subject of theoretical research for computer scientists / algorithm specialists for almost a decade now

Very few real examples of MANETS being used in real life

Modern-day implementations restricted to fields of military & combat, disaster management prototypes, etc

Static Networks



(a) Cellular network

Hierarchical control structure

Centrally infrastructure intensive

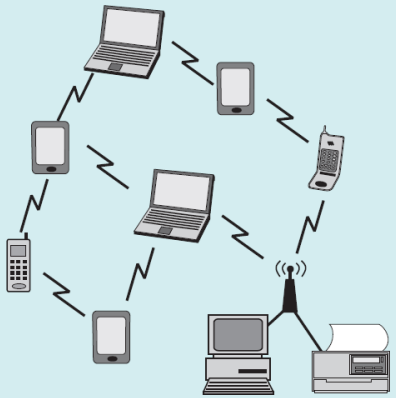
Links define Network

Need a ticket, a taxi to take you home etc

Can’t change a flight mid-air

Flat, decentralized network

Ad-hoc Networks



(b) Mobile ad hoc network

Meagre infrastructure requirement

Network defines links

Fly free where you will as long as you have friends around

Leave a flock, Join a flock

Literature Review

MANETs – Underexplored Terrain

Application scenarios to attract user attention are missing

Lack of effective MANET implementations that can be used by non-expert users

Lack of a holistic approach to link together the disparate communication possibilities offered by MANETs

“Real applications addressed to people outside the research community still have to be developed”

Most research focuses on MANET as a network configuration only and does not look at building applications which exploits its properties

Execution limited to simulation-based approach for performance evaluation

Real-world replicas restricted by high cost (in terms of setup time) and fluctuating node density

Attributes

Decentralized – No central server to host data

Host = Link = Terminal = Hub

Bound by physical range of signals

Wanted / Unwanted connections need to be distinguished

PSN – Haggle Project

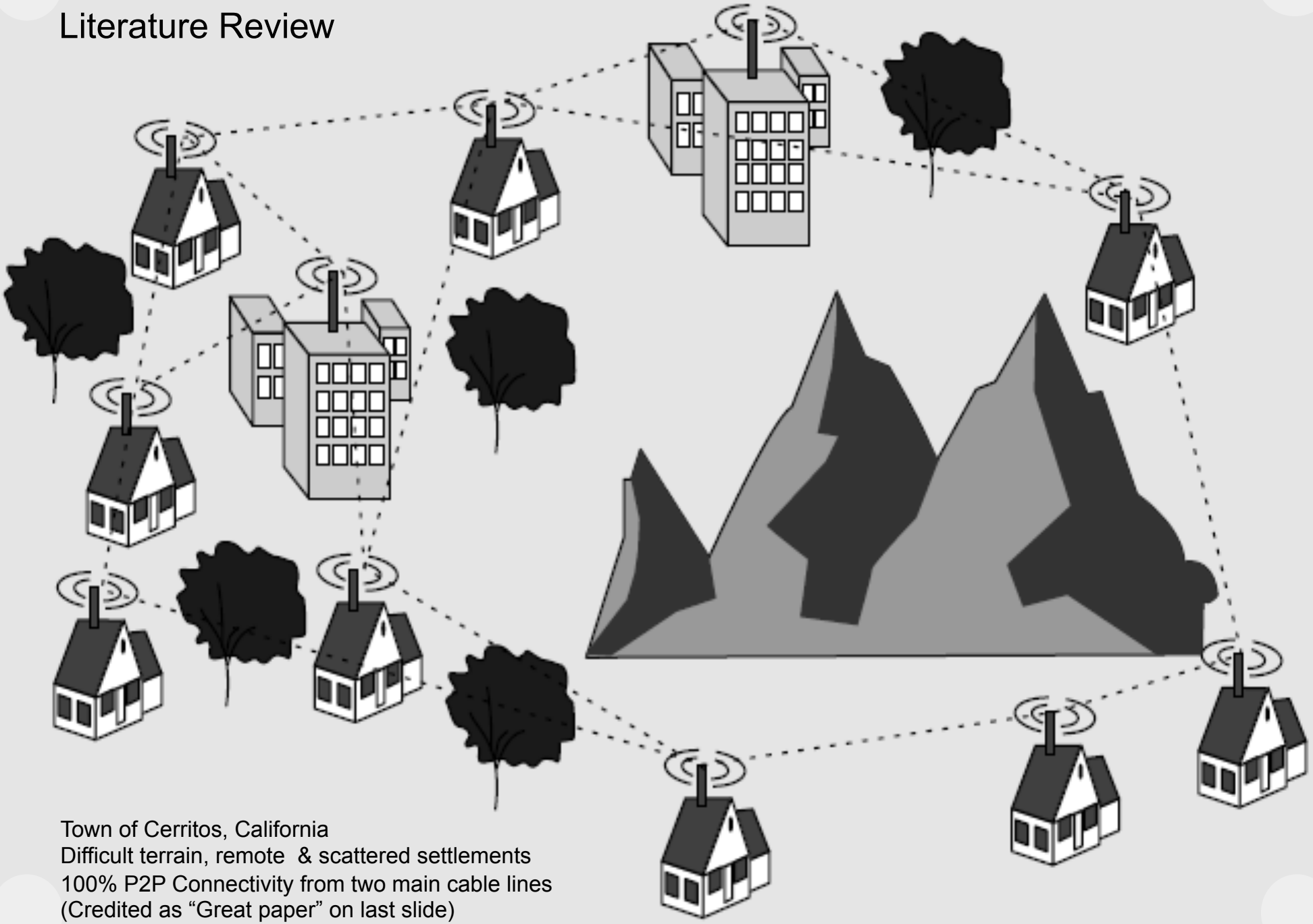


Commissioned since 2006 to explore Pocket Switched Networks (PSNs)

Opportunistic networks that can exploit any possible encountered device to forward messages

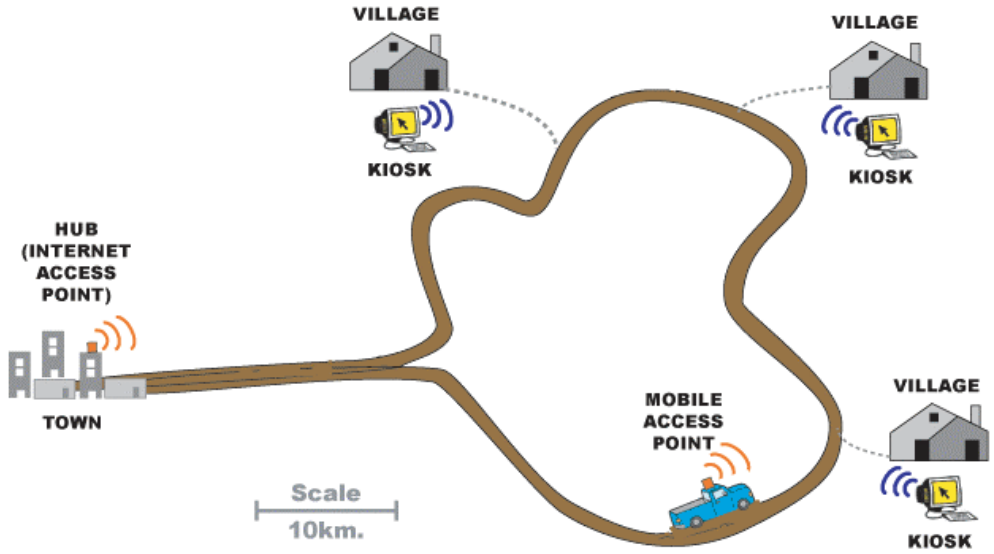
Guerilla approach towards enabling delay-tolerant communication networks

Literature Review



Town of Cerritos, California
Difficult terrain, remote & scattered settlements
100% P2P Connectivity from two main cable lines
(Credited as “Great paper” on last slide)

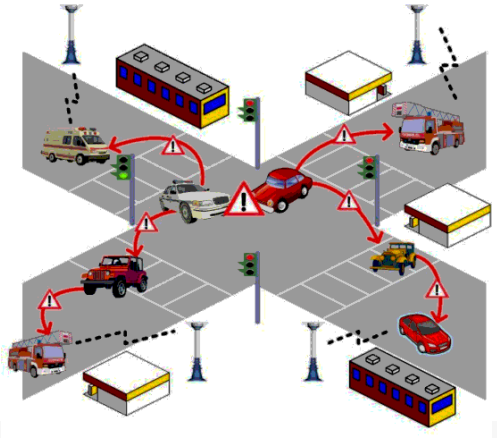
Literature Review

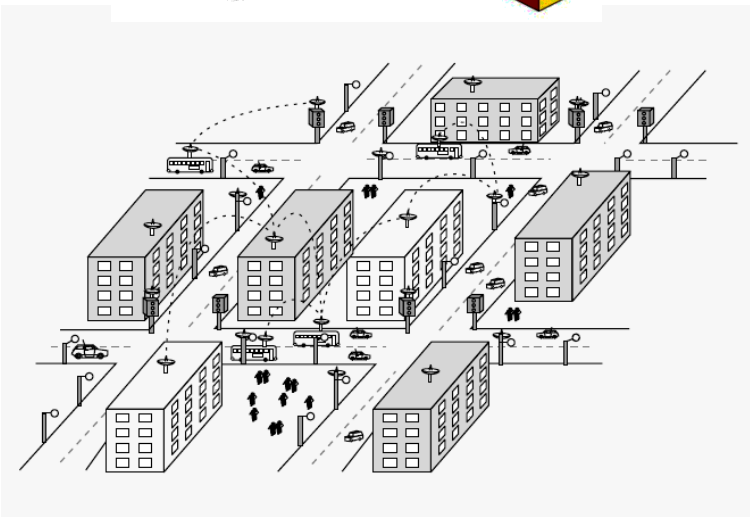






DakNET
Asynchronous communication through scheduled cache-exchange
Temporary ad-hoc connectivity – Data exchange "window"
(courses.media.mit.edu/2003fall/de/**DakNet**-Case.pdf)





Portsmouth PORTAL
Intelligent transport system for traffic monitoring
Real-time updates on public service vehicles (from that Awesome paper)

Literature Review



Ad-hoc networking for end users?

Lost in the ocean of connectivity options within Win7

Microsoft, Intel, Motorola (Google) and CISCO have invested substantially in AN research

AT&T, Verizon, etc don't see a lot of scope in the near future (we know why)

Primary Research

pptPlex Section Divider

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User Study Summary

Study 1 : Call log analysis
Study 2 : Mobile Internet : Use (and the lack of it)
Study 3 : P2P programs: User Opinions

Aim:	To understand the “scale” of communication
Sample Size:	17 Respondents (12 M, 5F) Spread across a wide socio-economic spectrum Educational Backgrounds: From illiterate to MBA Age Group: 22-60 years (Study 2) Current or prospective users of mobile internet
Tools:	(Study 1) Analysis of call logs + SMS (Study 2 &3) Casual Enquiry

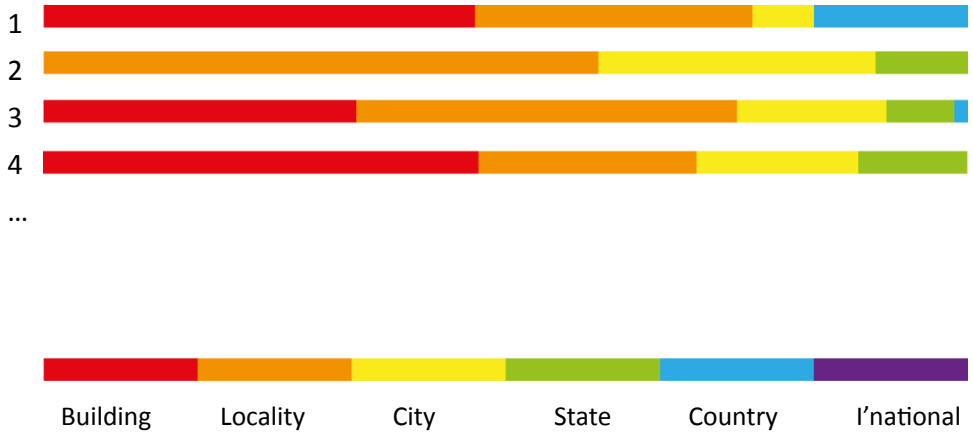




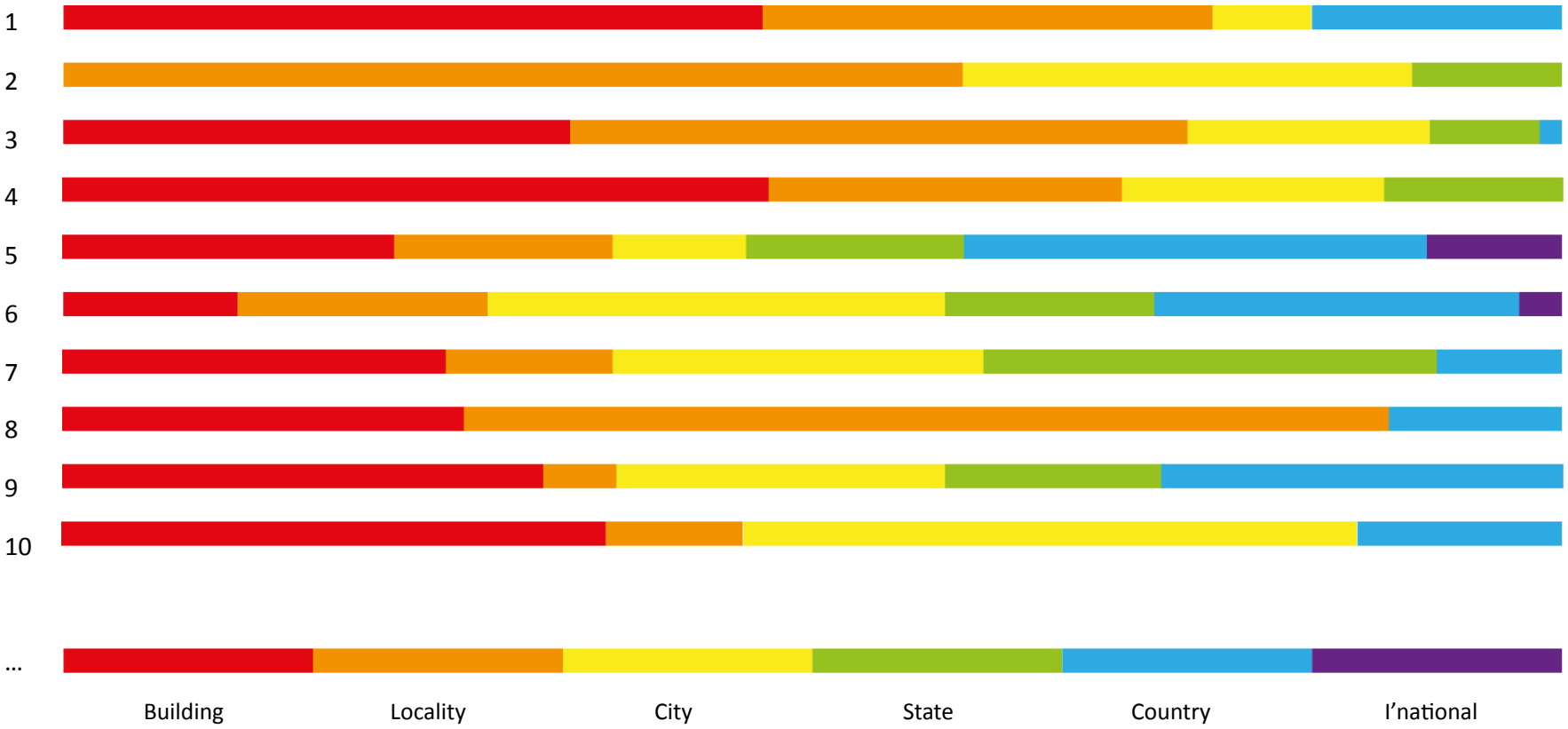


Call Log Analysis (Sample)

Sr No.	Name	Number of outgoing calls made to people living in						
		Same Building / Complex	Same Locality	Same City	Same State	Within India	International Calls	Total (Automatic)
1	Dhaumya	14	9	2	0	5	0	30
	Automatic>>	46.66666667	30	6.666667	0	16.6666667	0	100%
2	Hitendra Makwana	0	6	3	1	0	0	10
	Automatic>>	0	60	30	10	0	0	100%
3	Pratik Barot	23	28	11	5	1	0	68
	Automatic>>	33.82352941	41.17647059	16.17647	7.3529412	1.47058824	0	100%
4	Dilip Gandhi	8	4	3	2	0	0	17
	Automatic>>	47.05882353	23.52941176	17.64706	11.764706	0	0	100%
5	Mrunmay Mehta	12	8	5	8	17	5	55
	Automatic>>	21.81818182	14.54545455	9.090909	14.545455	30.9090909	9.090909091	100%



Call Log Analysis (Sample)



- Inferences:
  - Number of calls made to people nearby >> Long distance communication
  - Length of communication grows as distance increases
  - Very short range calls usually less than one sentence long (“Where are you? On my way”)
  - For professional purposes, email is preferred (not applicable for all users)
  - Short calls are mostly impromptu, “follow-up” calls
  - Long calls are usually planned / scheduled

User Study Summary

Study 1 : Call log analysis
Study 2 : Mobile Internet : Use (and the lack of it)
Study 3 : P2P programs: User Opinions

Aim:	To understand the motivation, methods & habits of information seeking / consumption
Sample Size:	17 Respondents (12 M, 5F) Spread across a wide socio-economic spectrum Educational Backgrounds: From illiterate to MBA Age Group: 22-60 years (Study 2) Current or prospective users of mobile internet
Tools:	(Study 1) Analysis of call logs + SMS (Study 2 &3) Casual Enquiry


User 1
Age: 39
Occupation: Auto-driver + Plumber
Handset: Sony Ericsson Walkman (Prev. Handset: Motorola)
Fluency of Operation: Very Low
“Why ask machines? I ask fellow autowallas. Asking people works better because it is empathetic, relevant, and negotiable.”
Where does the “downloadable stuff” come from? “Yeh message bhejnewale log hote hai na.. Maine reply kiya toh unko malum chalega aur phir woh mere number pe cheez bhejenge..”
Stores all SMSs which contain the word “free” – “Free ka cheez try karneka, phir pasand nahi aye toh nai leneka”


User 2
Age: 22
Occupation: Shop Owner
Handset: LG Cookie (Prev. Handset: Nokia 6630)
Fluency of Operation: Fairly high
“I don’t use email or friendship sites. All my friends are nearby only, we meet up every other evening, so all of that is no use.. At the most I use messaging.”
“I did make an email ID once.. Never had to use it”
Sharing of songs, music videos, etc common – done via MMC swapping
I don’t find good songs on the internet (What good songs?) Gujarati songs.. Mata no sanedo, etc. I usually copy songs from a friend. He has a cyber café, charges Rs. 10 for 2gb songs.


User 3
Age: 52
Occupation: Transportation Business
Handset: Nokia XpressMusic (Prev. Handset: Nokia 6223)
Fluency of Operation: Average
Extensive travelling, vaguely aware of online maps but never uses it –
“Apna sab jugaad kaam hai, jyada confuse hua to party ko seedha phone karneka”
Considers the mobile predominantly as a communication device
“News ka kya hai.. Sab Delhi-Mumbai-Ahmedabad.. Humare gaon ka thodi aata hai!”
Does not exactly know what internet is or does, and accidentally ends up using it (causing balance deduction)

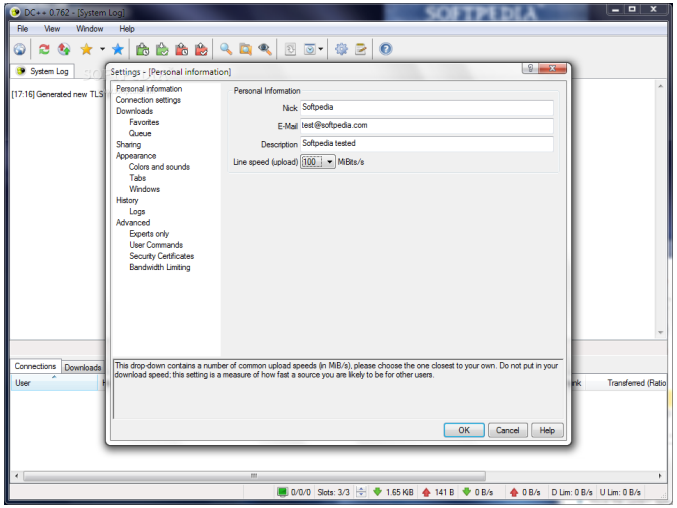
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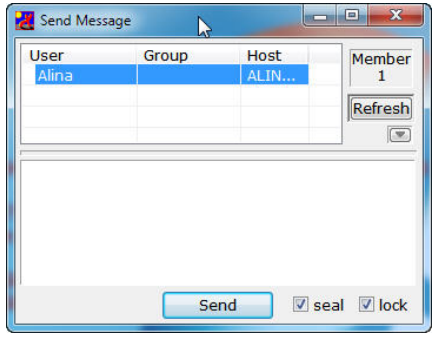
Aim:	To understand the motivation, methods & habits of using P2P programs
Sample Size:	6 Respondents (5M, 1F) Students / Working professionals Above average proficiency at using computers / internet Age Group: 16-30 years
Tools:	(Study 1) Analysis of call logs + SMS (Study 2 &3) Casual Enquiry

P2P Programs: User Opinions

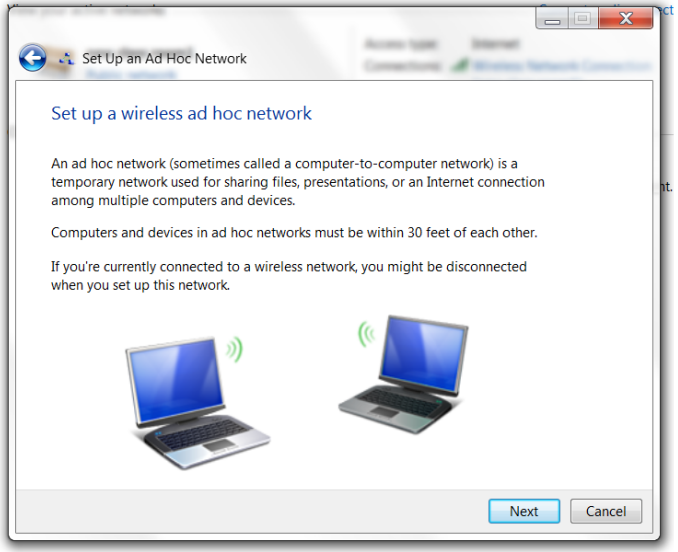
DC++ (File sharing platform)



IP Messenger



Windows Ad-hoc wifi



"Sharing files and messages without coming under the scanner is very easy and convenient"

"Fantastic substitute for mainstream internet – 99% times I get what I am looking for"
(Refer to IIT students journal of LAN-ban woes)

"I never have to log in. No ID, no password. Its like physically being a part of it"

"Intra-enterprise communication and file-sharing does not have to eat into my internet bandwidth"

"Much more casual than ____ messenger. I do not have to worry about being logged or being on record all the time"

"P2P Interfaces do typically look very primitive and out of time amongst today's modern software"

Insights

pptPlex Section Divider

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- Call Log Analysis:
  - Number of calls made to people nearby >> Long distance communication
  - Length of communication grows as distance increases
  - Very short range calls usually less than one sentence long (“Where are you? On my way”)

- Mobile Internet: Usage
  - Means are secondary, Content is prince, Context is king
  - Mobile internet use is “social footprint” sensitive
  - Communities have a level of online presence (Indian ones are negligible)
  - I don’t use mobile internet because (in order of popularity)
    - Monetary Charges disproportionate to my income / I don’t see value
    - No motivation to use mobile internet (Lack of relevant content)
    - Oblivious to the existence of the internet
    - I believe people are better sources of information
    - Need to use internet but not able to use the current interface
    - Speed too less, screen too small, etc.
  - Cloud it too fluid to grip (aka I cannot physically see where my information goes)
  - Mobile internet not suitable for handling long, comprehensive information

MANETS - Functional Understanding

- We can:
  - Use it merrily without the need for network coverage
  - Use it merrily without a penny in our pockets
  - Roughly locate the physical position of a node within the network
  - Handle active dynamic changes in the network structure (person moving from IDC to H14)
  - Use the same node (mobile) and seamlessly move across networks
  - Exploit nested network (Me > 7th Floor> B Wing > Hostel 14)

- We cannot:
  - Ensure that the node will stay within physical wireless limits
  - Use P2P as the primary channel for time-critical message exchange
  - Centrally monitor/ patrol / restrict all connected nodes
  - Control the speed of communication (depends on the node density)
  - Use the conventional admin-user hierarchy across terminals

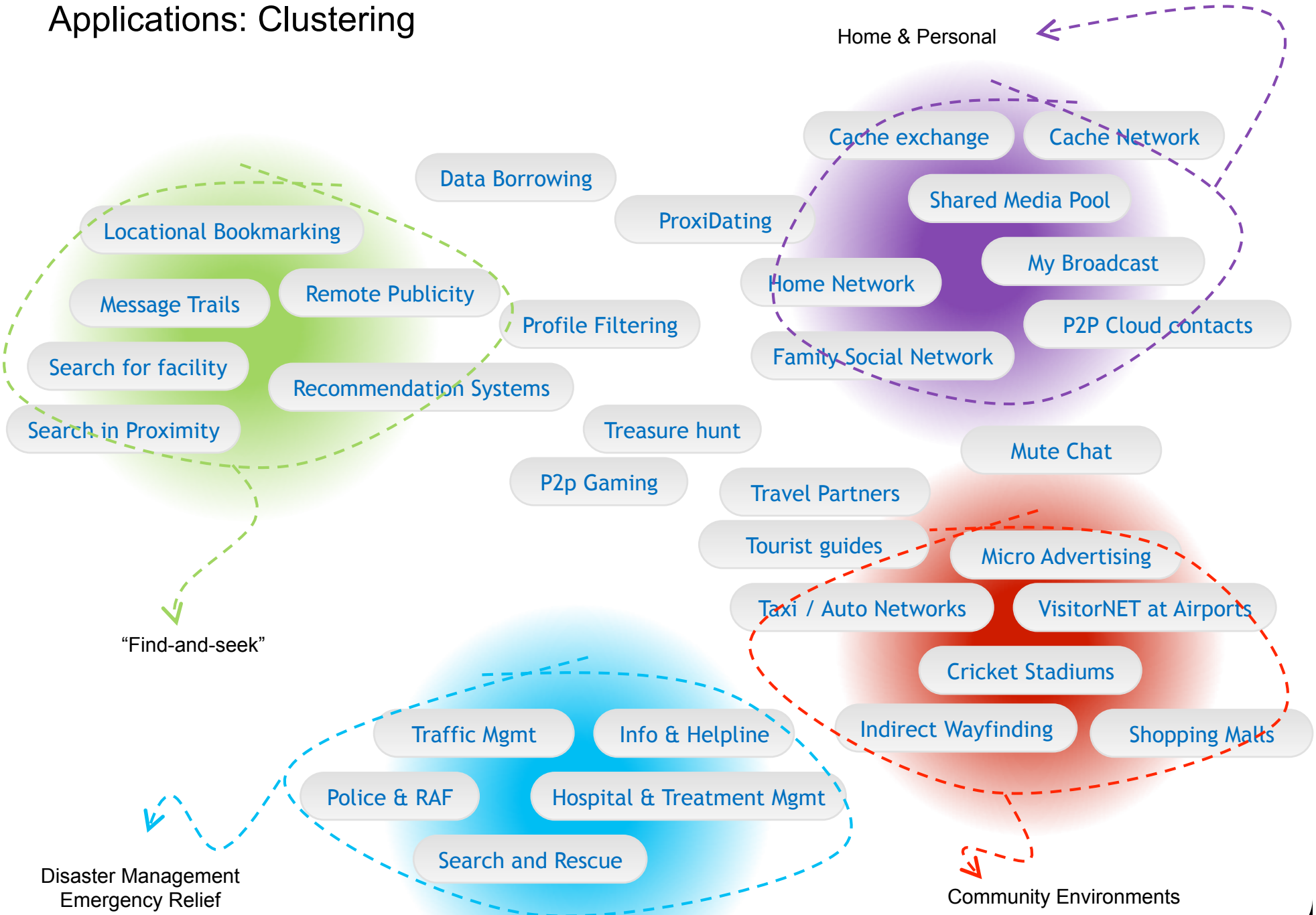
Idea(s)

Stage 2½ , 11.10.11

Applications



Applications: Clustering



Ideation

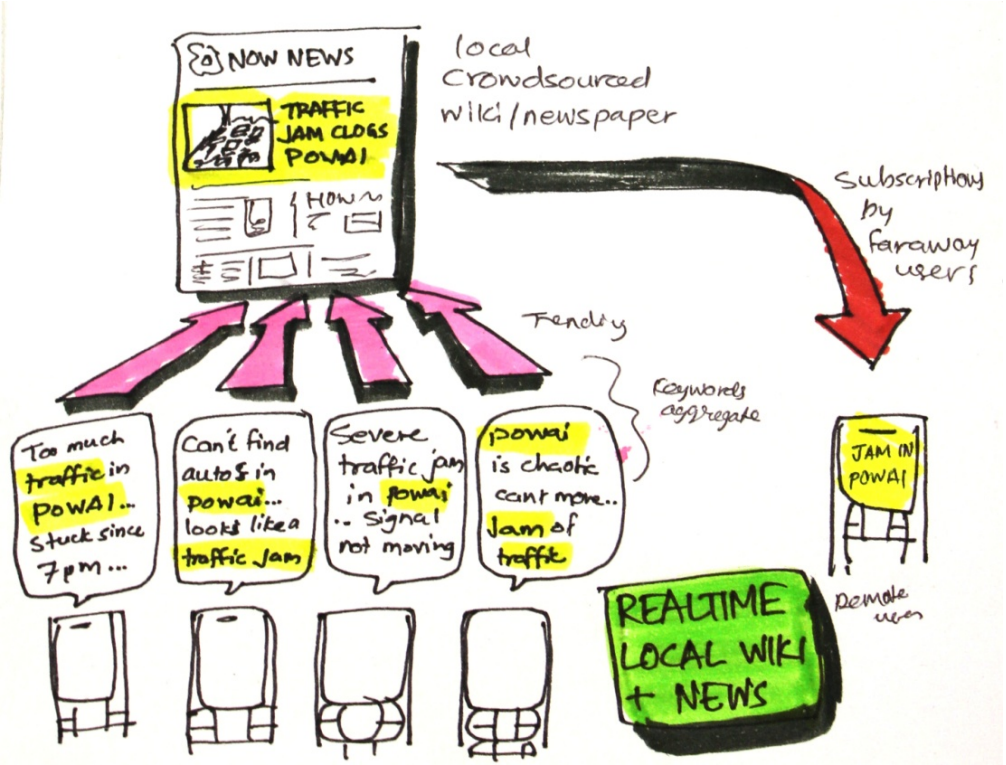
- P2P Realtime Local Wiki + News

It is a crowd sourced wiki + newspaper focussing on micro-locations which can be accessed remotely from anywhere

Similar to FlipBoard but fuelled by local trends, topics and happenings

Multimedia (Images / Videos) also get featured in the vPaper

Compilation & hierarchy changes as uses changes preference of area under consideration



Ideation

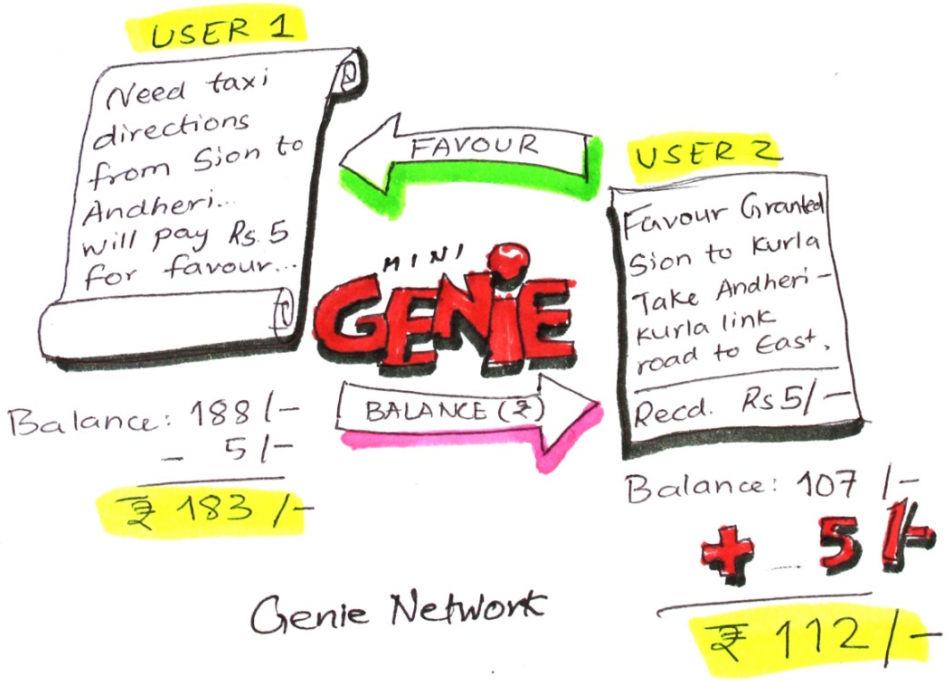
- “Mini Genie” Favour network

enabling people to help each other by supplying critical information which may be out of reach for one user but conveniently available to another

interesting prospect from the perspective of monetization

Users who seek information dearly can allocate a small amount of their prepaid balance / postpaid credit

Fellow users who supply the information get that balance as reward



Ideation

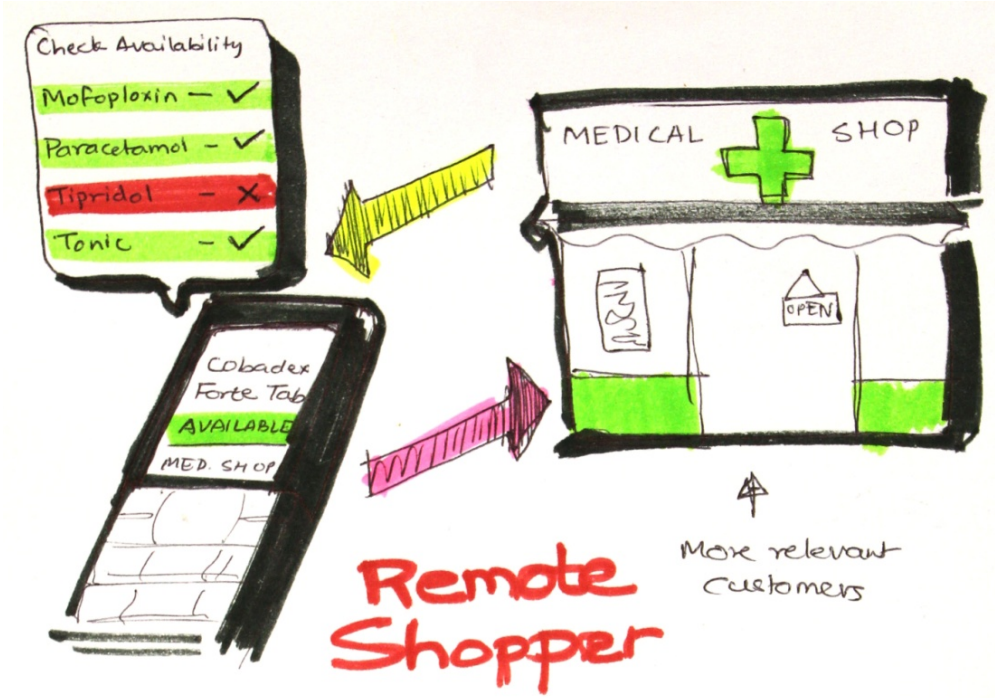
- Remote Shopping Assistant

finding if a particular item is available at a given shop or not even without entering the shop

woo customers specially where many shops are crammed into one physical location - Malls, Fashion Street (Bombay), Palika Bazaar (New Delhi), etc.

For the customers, it can serve the purpose of being a “deal hunter”

Customers can rate dealers in order to help future customers choose



Ideation

- P2P Chatbox

The most fundamental application to exploit the potential of P2P configurations

A comprehensive peer-to-peer messaging application tailor-made for mobile devices is yet to be seen

Simple, neutral messaging system which works across a wide spectrum of contexts

Authentication & Privacy – Hot research topics



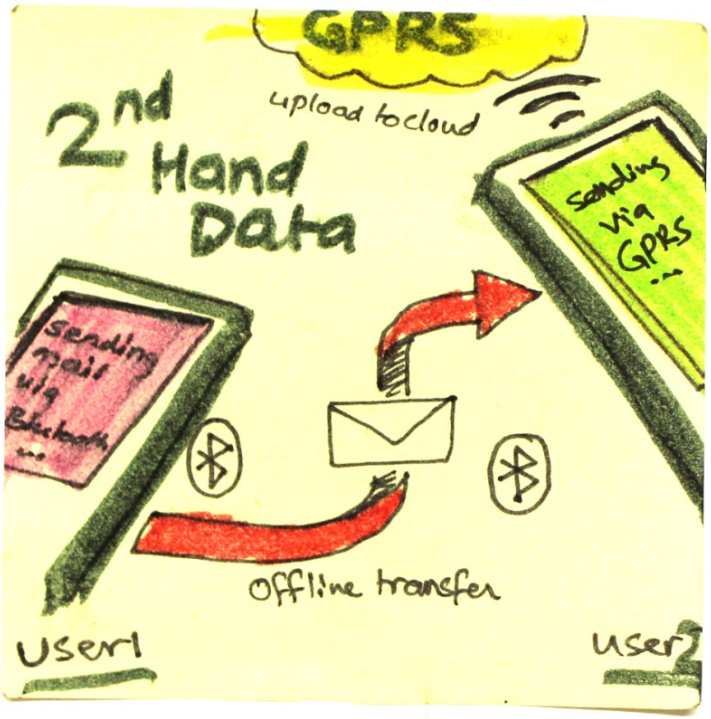
Ideation

- Surrogate Web

An alternate method of communication for people who have infrequent data usage on their phones

A tethered data connection can be provided by another user in close proximity who has an active data connection

Data charges caused due to this can be settled by a corresponding transfer of balance between respective users



Design Direction

- Brief
  - To design a P2P mobile-based social networking application for message and media exchange within proximal networks which should include:

  (i) Free & Basic “search & find” functions

  (ii) Possibility of installing “plugins” for other specific functions

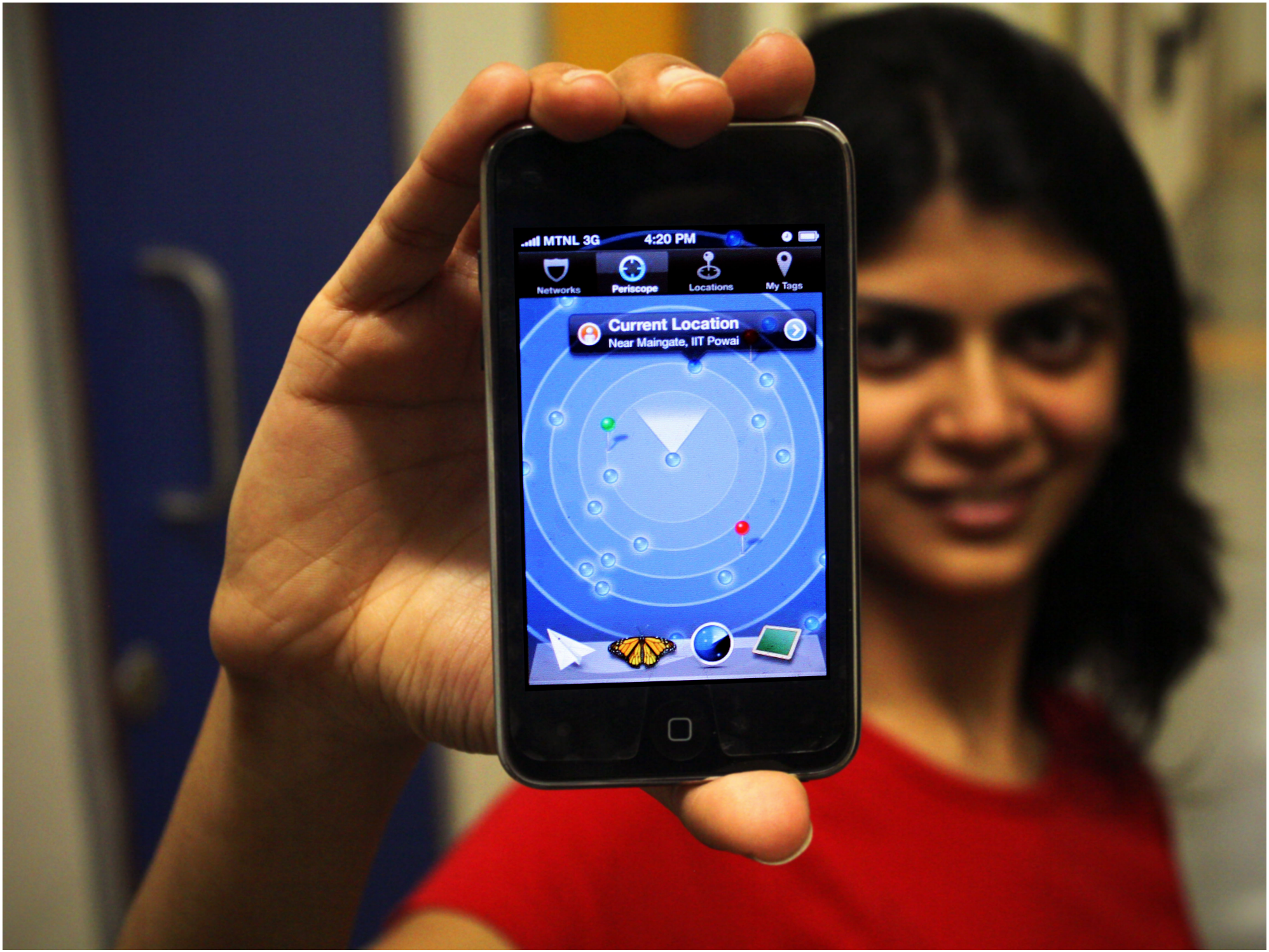
- The application must:
  - Communicate the right mental model (P2P) → Host = Link = Terminal
  - At-a-glance information about current network around the user
  - Not be hyperactive / attention-demanding against the users wish
  - Allow users to merrily converse with one-another
  - Serve as a neutral platform for basic P2P exchanges
  - Have the capacity to employ secondary plugins for special functions

Pingle

pptPlex Section Divider

The slides after this divider will be grouped into a section and given the label you type above. Feel free to move this slide to any position in the deck.


PINGLE


MTNL 3G
4:20 PM
Networks
Periscope
Locations
My Tags
Current Location
Near Maingate, IIT Powai

Shout Board



Radar



TrailBlazer





Message



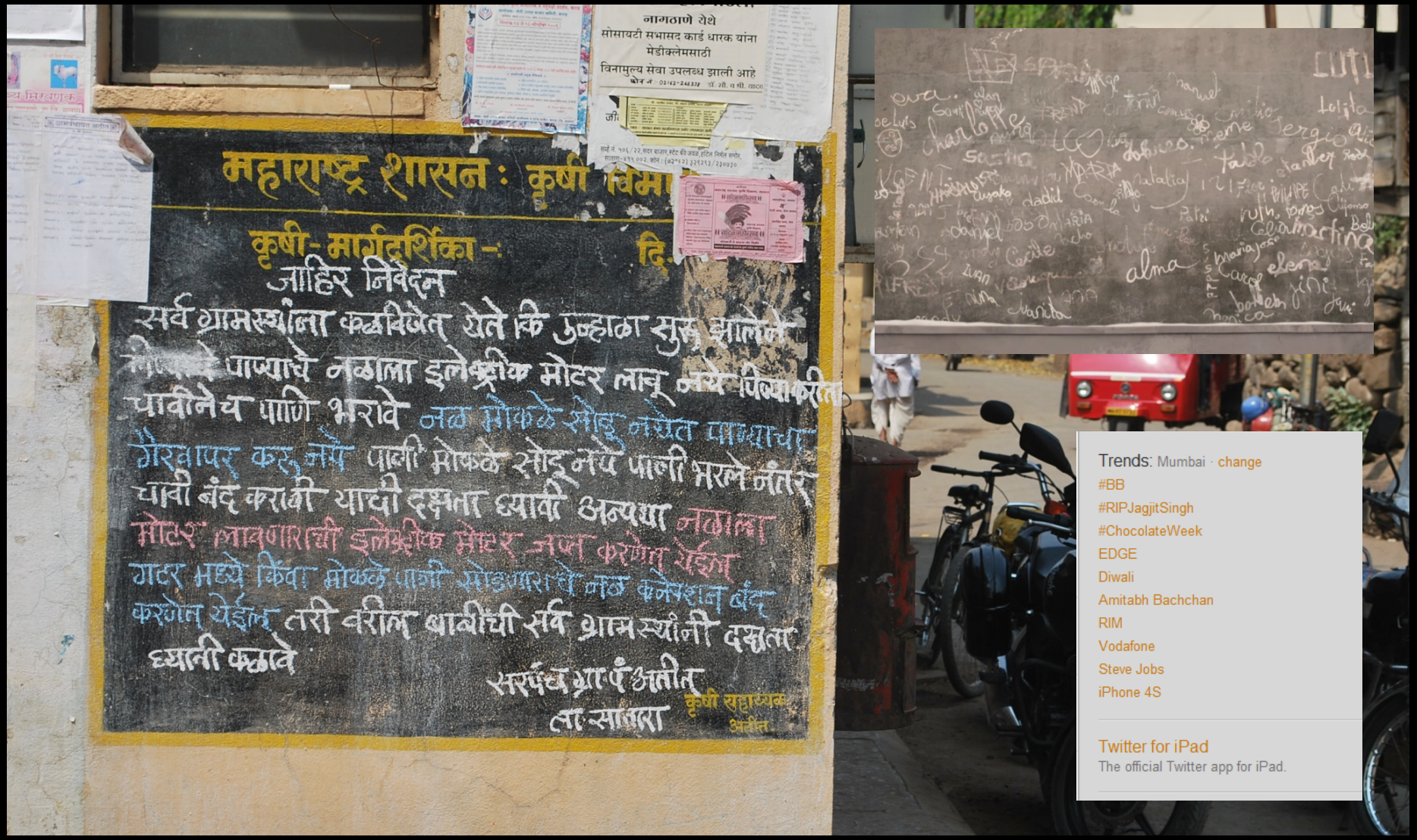
S.O.S



Housekeeping

Shout Board

SHOUTBOARD

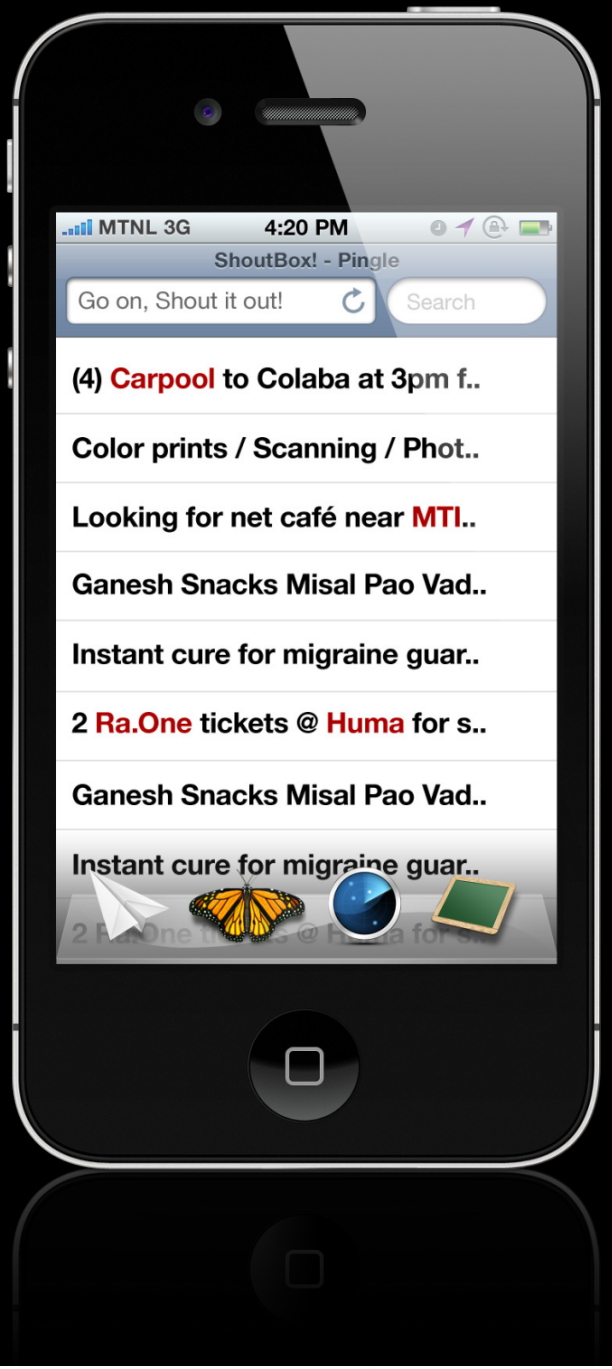




SHOUTBOARD

- is a public board enlisting all user-generated “shouts” in the network
- arranged according to keyword popularity (trending)
- User’s identity is not disclosed on the ShoutBoard (unless paired)
- Shoutboard modes:
  Buddy only / Trust sorted / Keyword
- Limited to 160 characters (1 SMS)
- Users can reply to / copy shouts

- Shoutboard is fully searchable
- Special permission required to contact an unknown person off the shoutboard





SHOUTBOARD

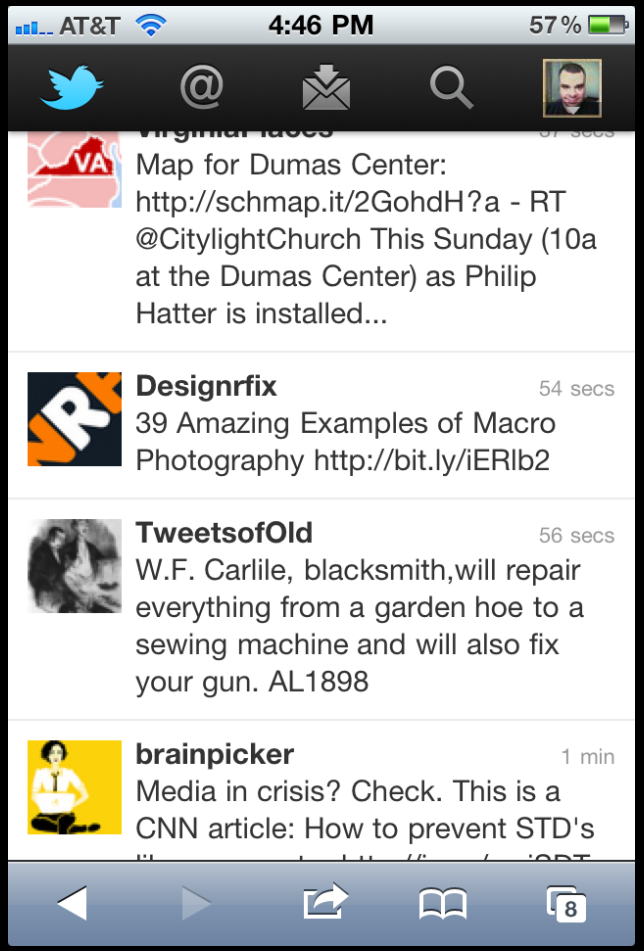
twitter + foursquare

- Names / Profiles

- Pictures

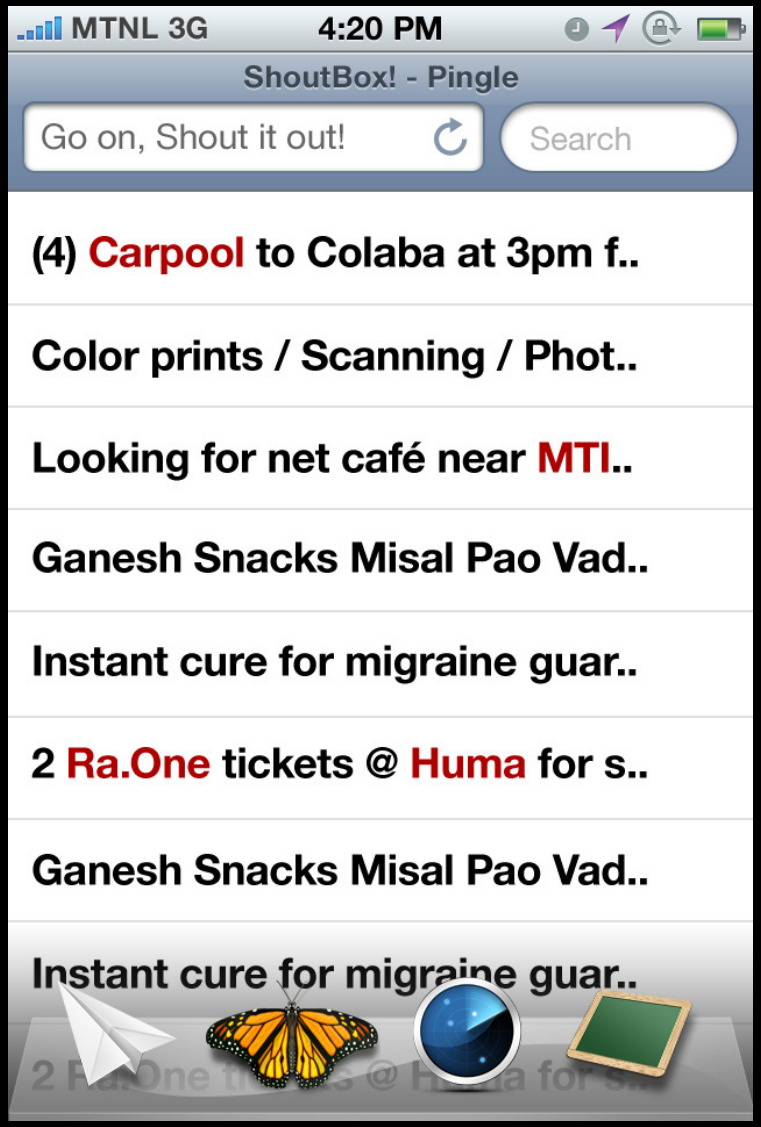
+ Trending

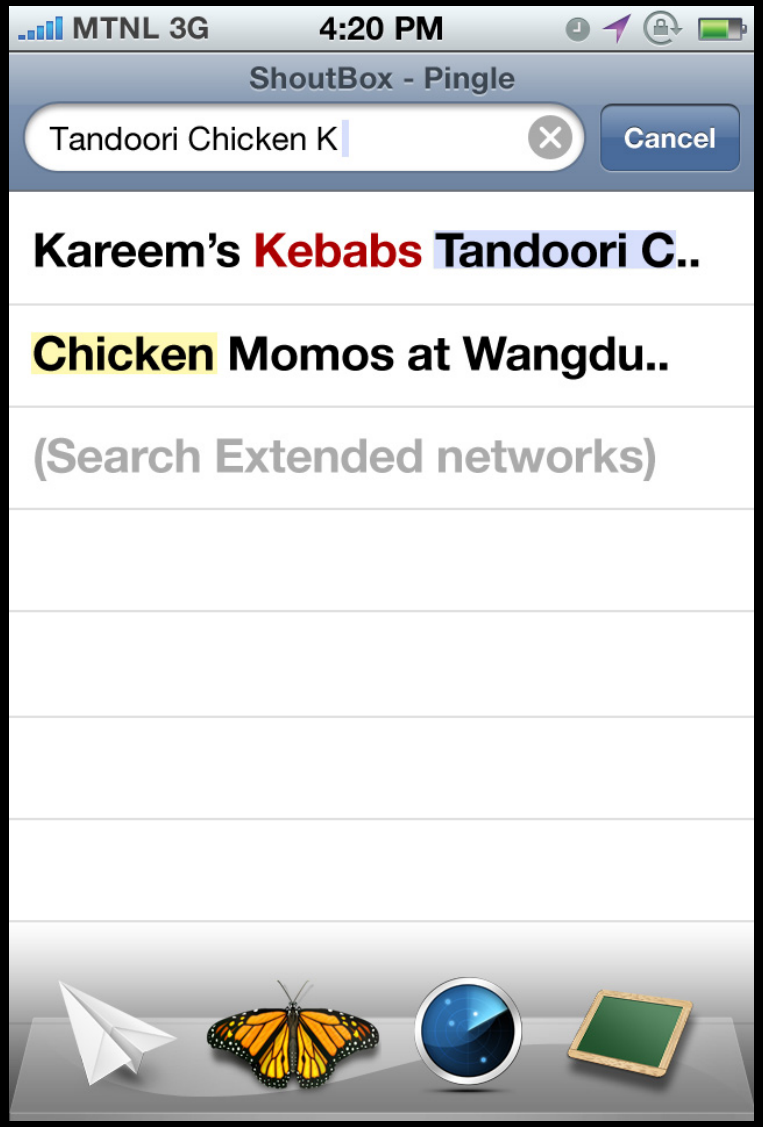
+ Trust rating

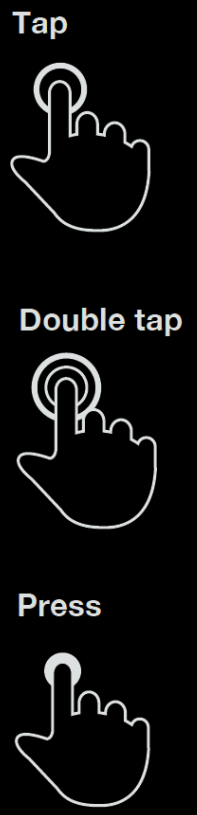



Shout Board

SHOUTBOARD

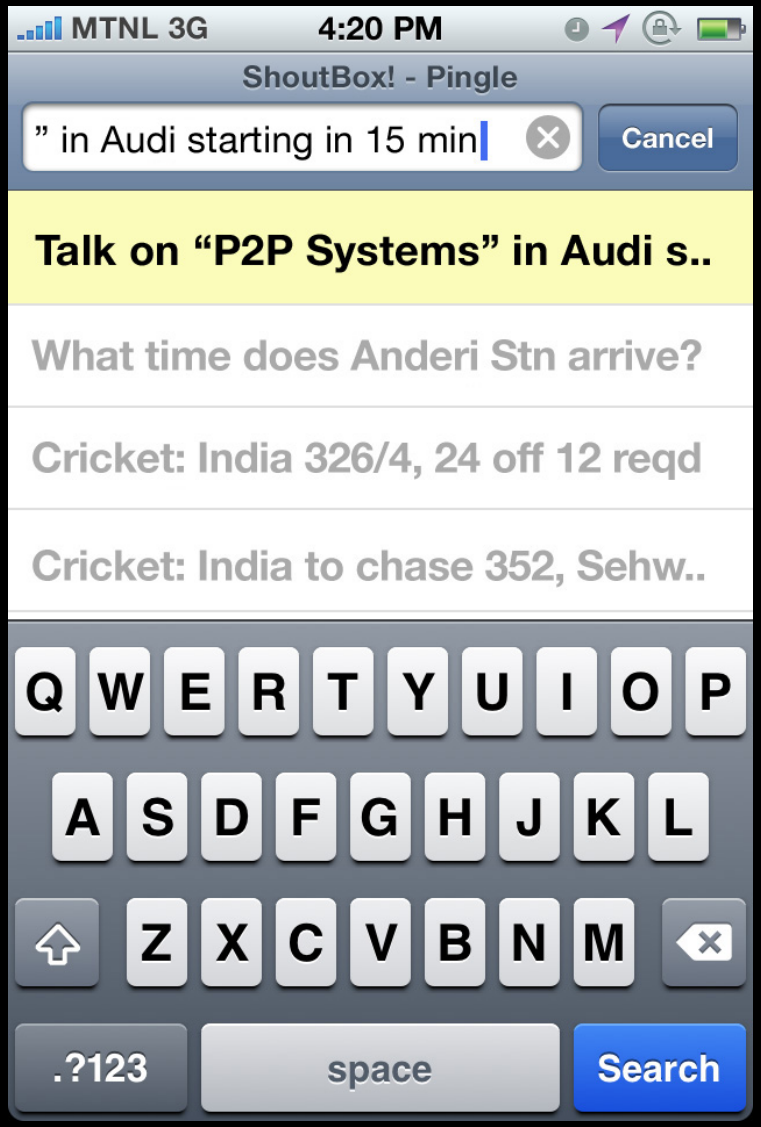

MTNL 3G
4:20 PM
ShoutBox! - Pingle
Go on, Shout it out!
Search
(4) Carpool to Colaba at 3pm f..
Color prints / Scanning / Phot..
Looking for net café near MTI..
Ganesh Snacks Misal Pao Vad..
Instant cure for migraine guar..
2 Ra.One tickets @ Huma for s..
Ganesh Snacks Misal Pao Vad..
Instant cure for migraine guar..

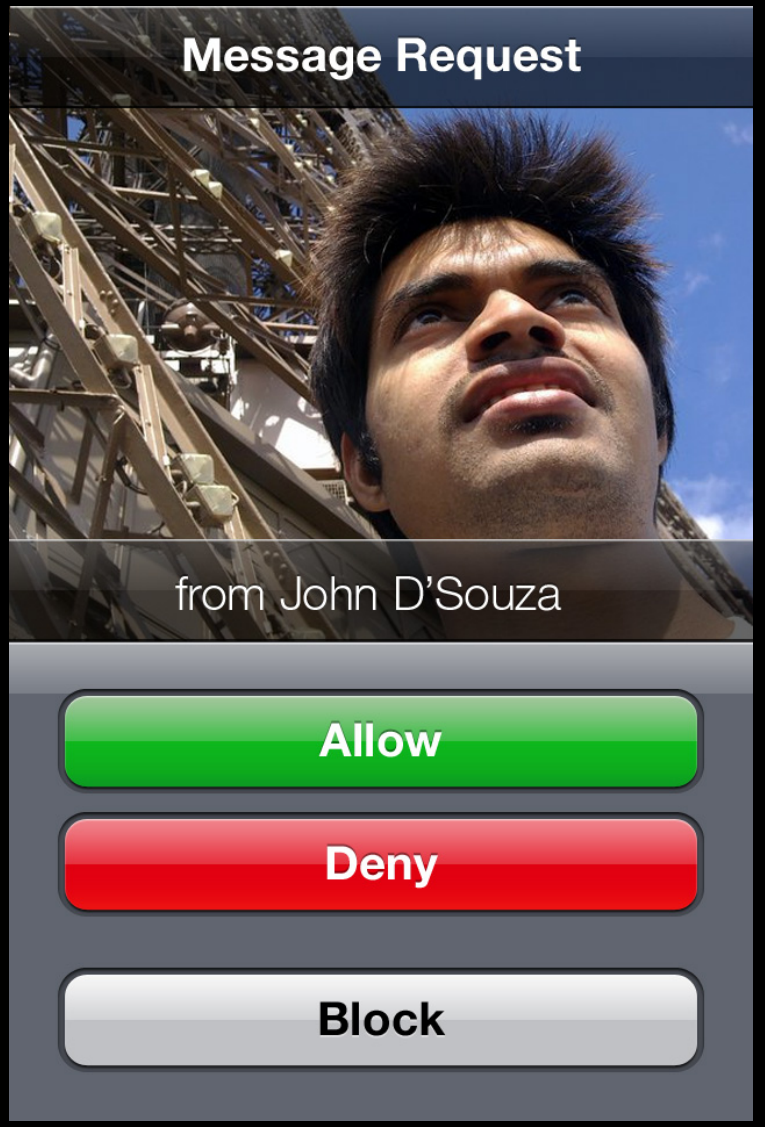

MTNL 3G
4:20 PM
ShoutBox - Pingle
Tandoori Chicken K
Cancel
Kareem's Kebabs Tandoori C..
Chicken Momos at Wangdu..
(Search Extended networks)

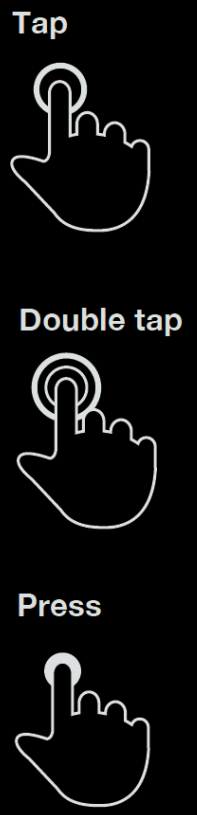

Tap
Double tap
Press


Shout Board

SHOUTBOARD

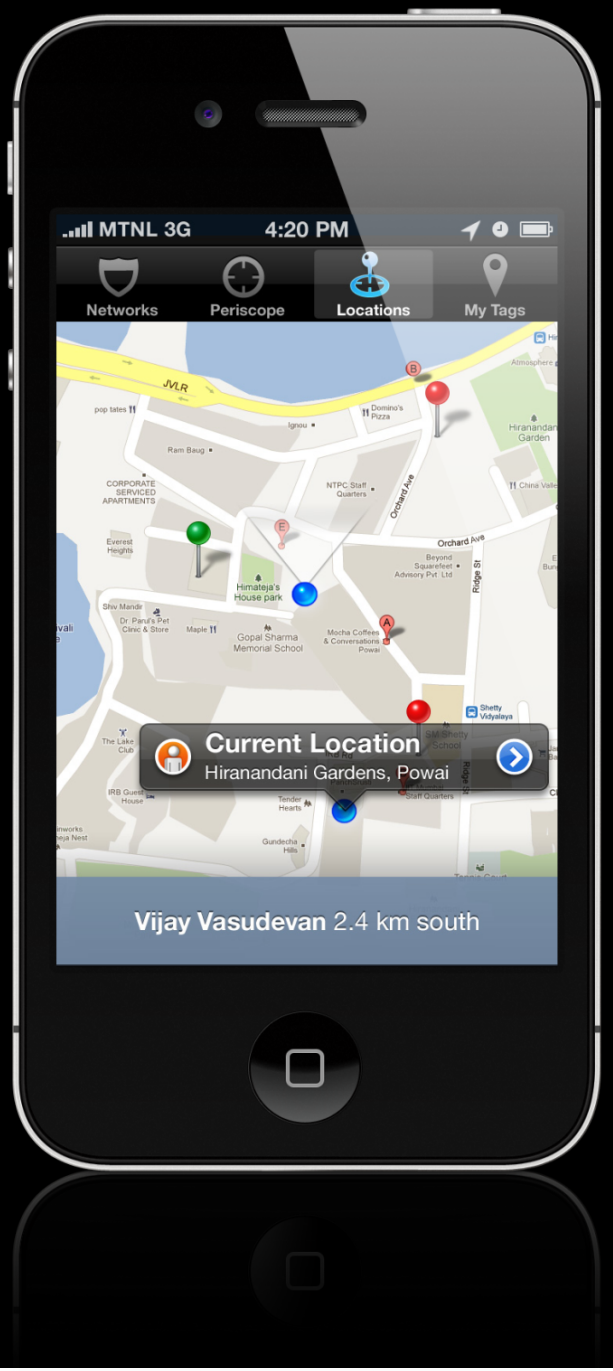

MTNL 3G
4:20 PM
ShoutBox! - Pingle
" in Audi starting in 15 min
Cancel
Talk on "P2P Systems" in Audi s..
What time does Anderi Stn arrive?
Cricket: India 326/4, 24 off 12 reqd
Cricket: India to chase 352, Sehw..
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
.?123
space
Search


Message Request
from John D'Souza
Allow
Deny
Block

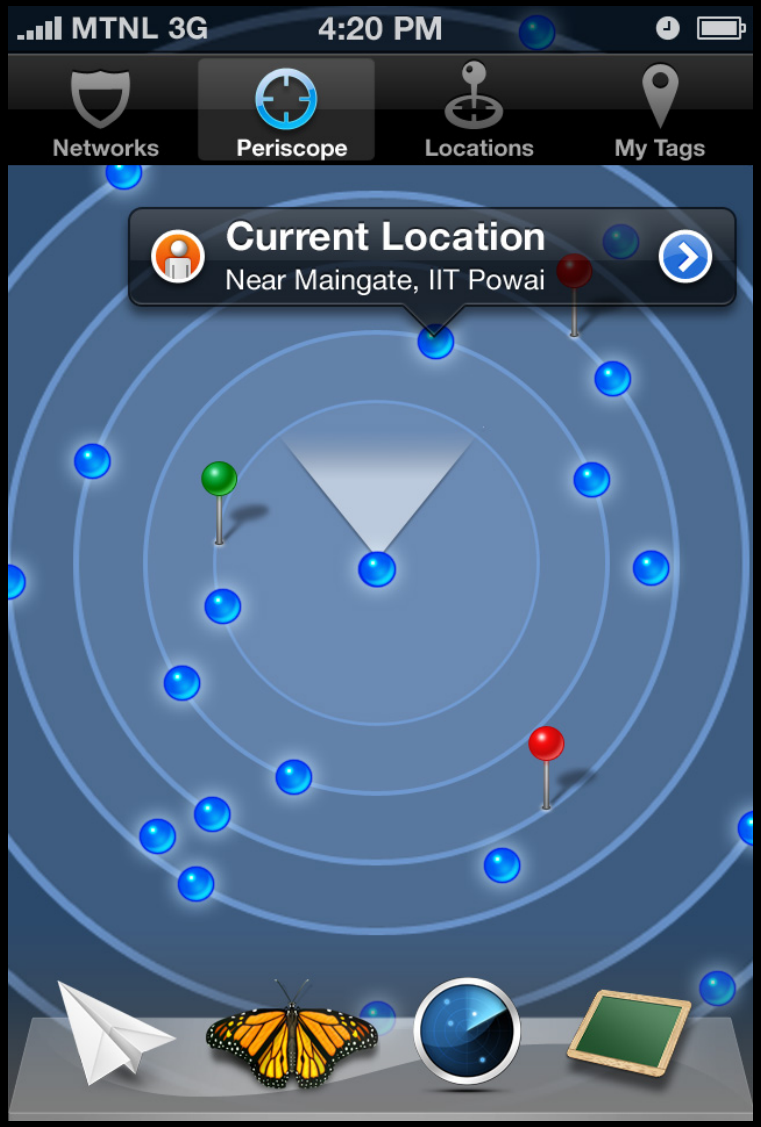

Tap
Double tap
Press

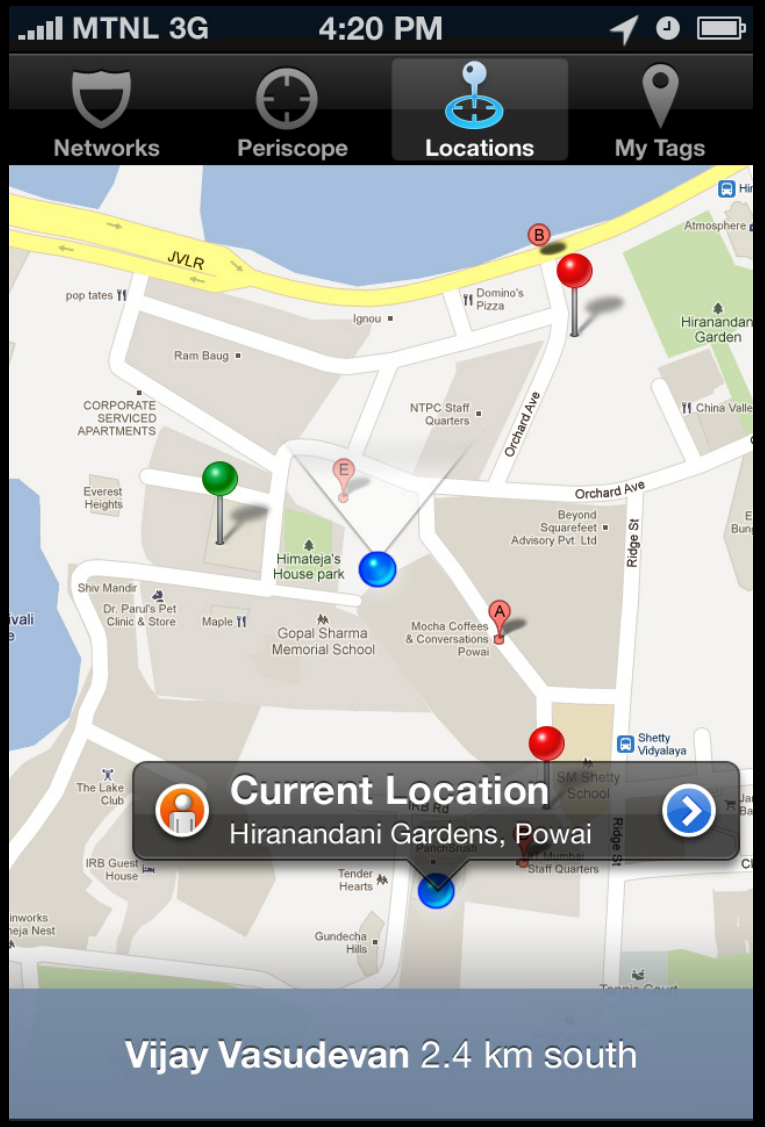
RADAR

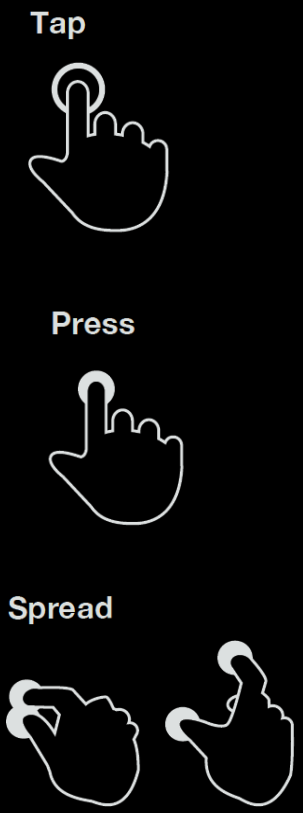
- is a map-based layout which shoes the position of the nodes around you within your network
- Realtime update of entry-exit & position (identifies moving / stable nodes)
- shows position markers only, does not disclose identity*
- Only paired “pinglemates” get to see each others identity
- Records history of your movement relative to the stable nodes
- Generate bird’s eye view of overlapping networks (1°, 2°, ...)



RADAR


MTNL 3G
4:20 PM
Networks
Periscope
Locations
My Tags
Current Location
Near Maingate, IIT Powai

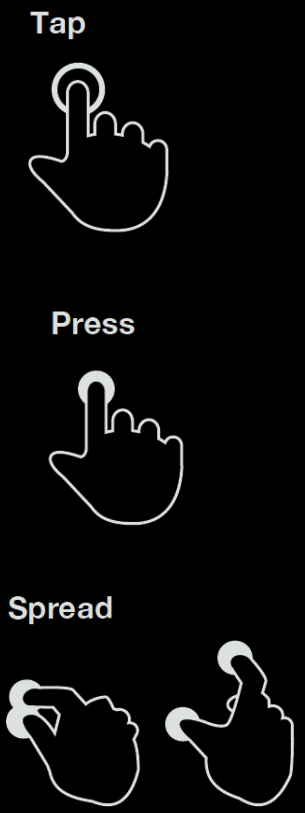

MTNL 3G
4:20 PM
Networks
Periscope
Locations
My Tags
JVLR
Ignou
Ram Baug
Orchard Ave
Himateja's House park
Gopal Sharma Memorial School
Current Location
Hiranandani Gardens, Powai
Vijay Vasudevan 2.4 km south


Tap
Press
Spread

RADAR


MTNL 3G
4:20 PM
Networks
Periscope
Locations
My Tags
Friends
Vijay
Dipak
Rajendra
Rajiv
Dhananjoy
Arpit
Dhaumya
...
Locations
Parel
Andheri
Mumbai Central
IFFCO Chowk
Noida
...
Trends & Keywords
Misal
IPL
Roger Federer
Sunny
Autorickshaw
Mirchi
Search or add tags


MTNL 3G
4:20 PM
Back
IDC
Done
Properties
Locations
Time-bound
OFF
Geolocked
OFF
Recieve Alerts
ON
Share this tag with..
Forget this tag
You are allowing Pingle to send you alerts related to the tag "IDC". You can change this setting anytime by holding down the tag.


Tap
Press
Spread



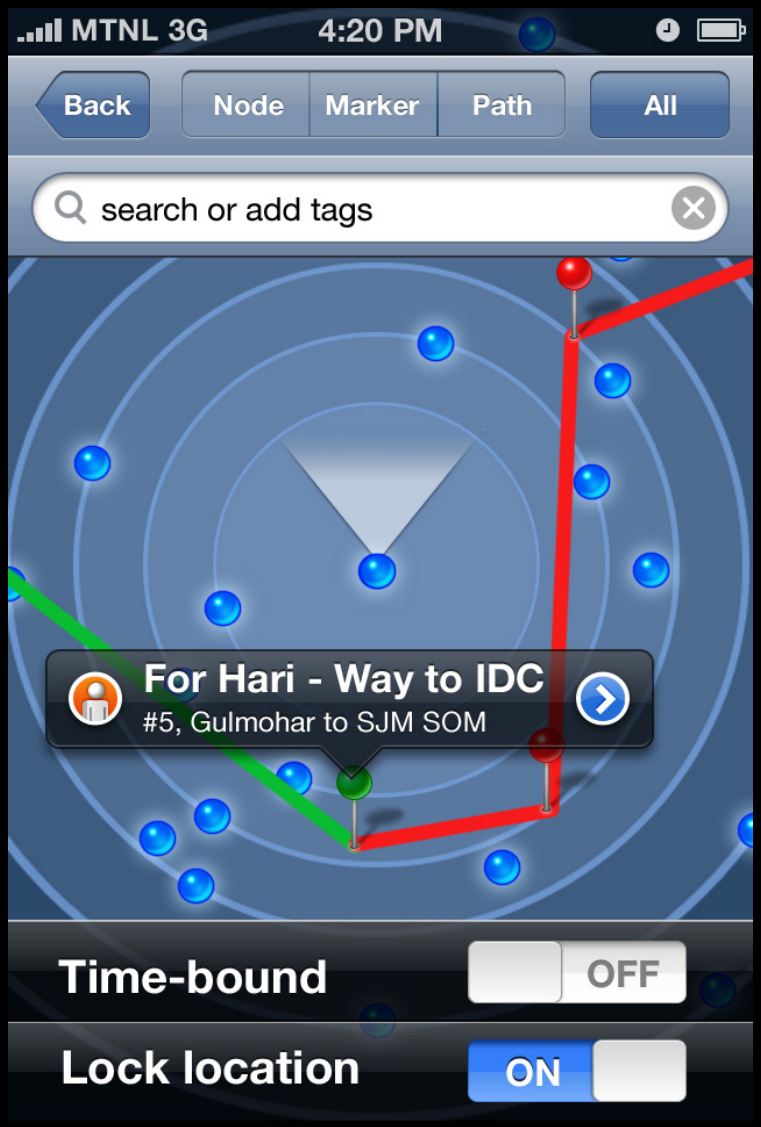
TRAILBLAZER

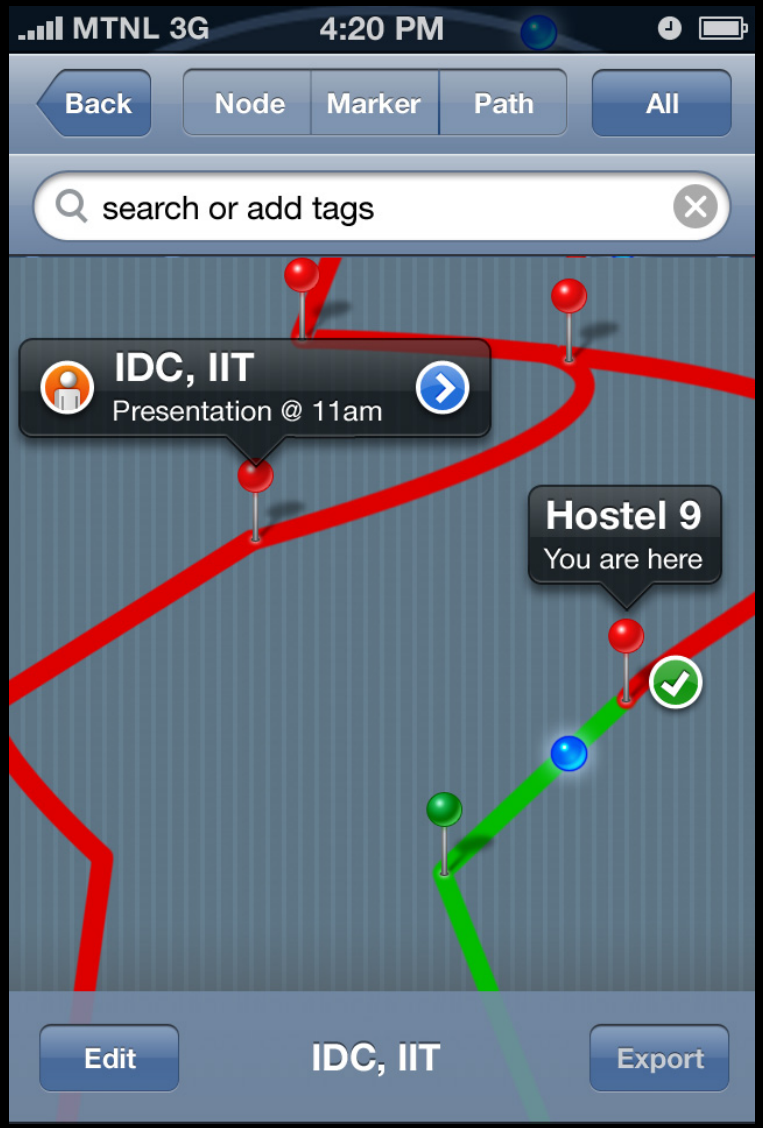
- is a spatial tagging utility – allows you to tag nodes / networks
- track your own movement across networks through tags
- tags can be clustered into tag threads
- Followable tag-threads can be sent to buddies
- also allows you to follow tagged keywords across networks through your shoutboard (eg, puncture)
- Option of creating time-bound tags (leave behind at airport) or location locked tags
- Individual tags can also be viewed via the radar, trailblazer specifically gives an experience akin to GPS

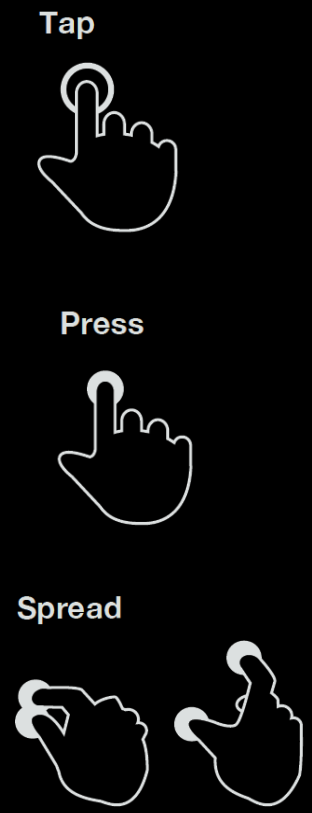




TRAILBLAZER







MESSAGE

- Send messages or media within the same network or across networks
- Messages can only be sent if

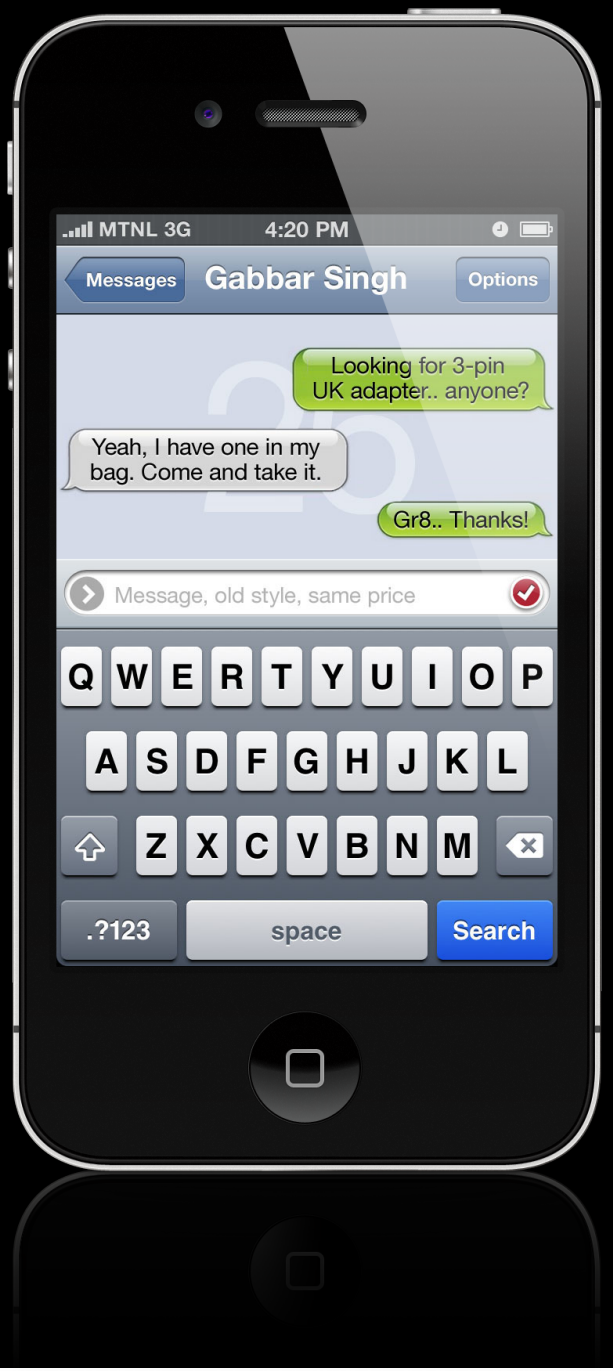
- Devices are paired (buddies / pinglemates)

- Recipient has authorized the sender from the ShoutBoard

- Heavier messages are split into smaller packets, allowing the user to move freely
- How to regulate message traffic?

- User gains credits for the number of messages / packets successfully delivered using his device as a channel

- Every message the user sends uses up some credit

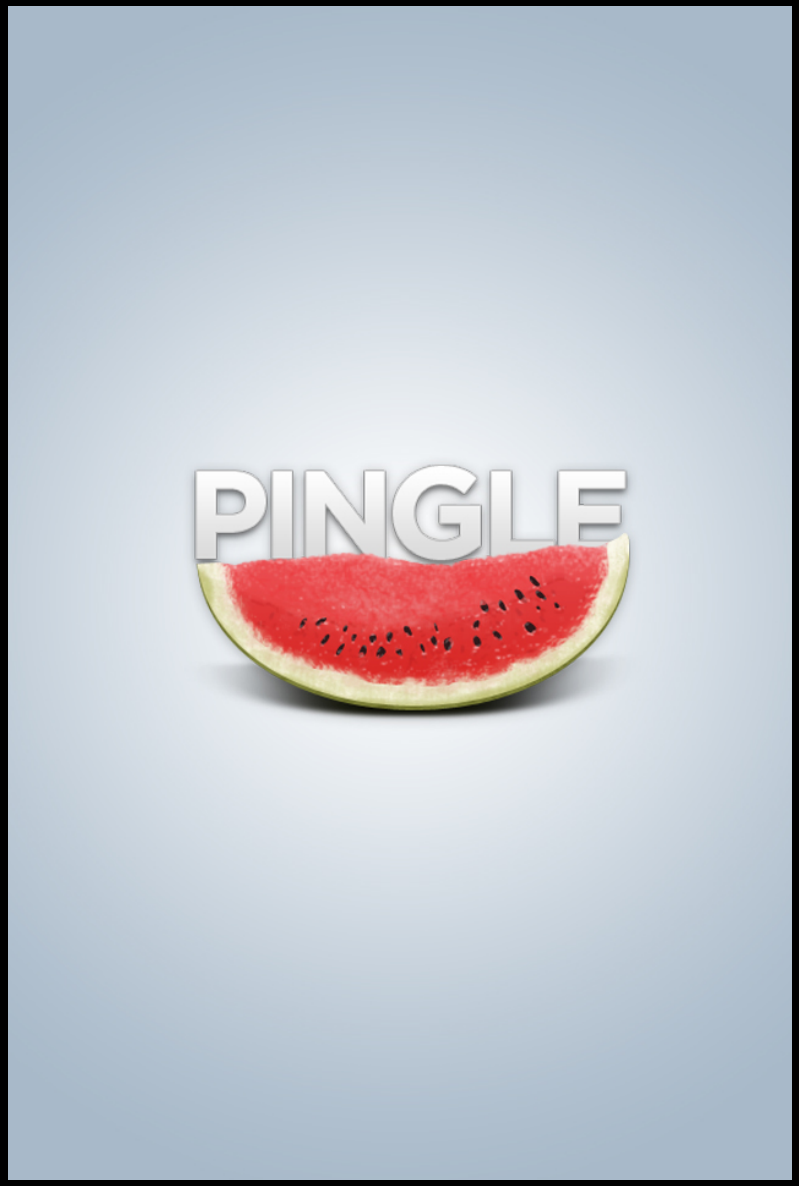


SOS MODE

- SOS Mode – First notifies emergency services
- Credit-free transfer of messages via mixed-mode – P2P as well as active network connection wherever available
- Regular SMS charges – deferred deduction
- In case of a disaster, the entire ShoutBoard becomes dedicated to relief – Critical phone numbers, Emergency warnings, etc are flashed
- Mixed connections (P2P + 3G) are used to scout twitter / news websites for information / warnings / assistance



PROTOTYPE



Prototype & Scenario

pptPlex Section Divider

The slides after this divider will be grouped into a section and given the label you type above. Feel free to move this slide to any position in the deck.

SCENARIO

BACKDROP

You are a student who will be presenting
a paper to a special panel at IDC, IIT Bombay.

Not only is this your first paper, this also happens
to be your first time in Bombay.

Testing

pptPlex Section Divider

The slides after this divider will be grouped into a section and given the label you type above. Feel free to move this slide to any position in the deck.

Testing

Test 1 : Whiteboard / Flash proto evaluation
Test 2 : Study of communication dynamics within a peer-circle

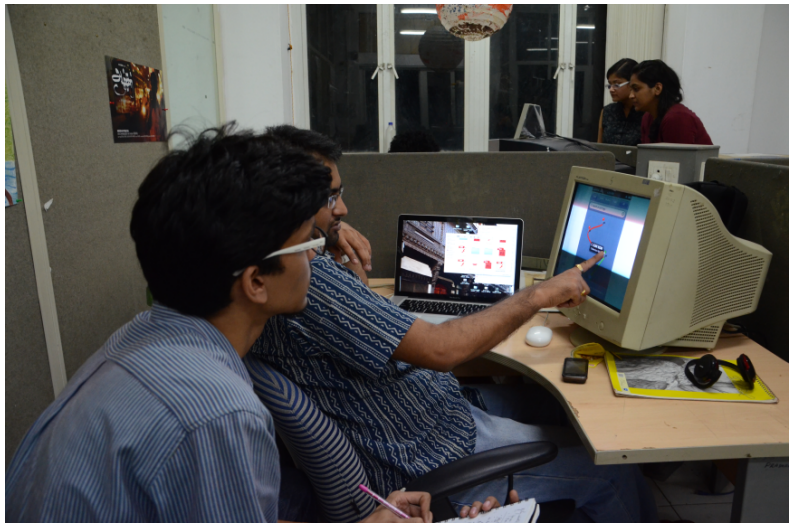
Aim: To understand the motivation, methods & habits of using P2P programs

Sample Size: 7 Respondents (5M, 2F)
Students / Frequent travelers / “Up-down” people
No bar on technical proficiency
Age Group: 19-29 years

Method:
1. Allow user to explore an iOS based device (10 min)
2. Verbal introduction to concept & terms
3. “Talk-aloud” of actions on flash prototype / whiteboard proto
4. Given sample situation, ask for narration on how they would use it
5. Questionnaire (Rate from 1=Strongly Agree to 5=Strongly Disagree)

Testing





Inferences:

1. Most users avoided going into “settings” as far as possible to accomplish any desired goal
2. Gestural actions (shake, etc) not easily taken up, users need prodding
3. Users tend to default to sending messages to friends instead of using shoutbox (uncertainty)
4. Confusion between Radar & Trailblazer – Distinct purpose not understood

5. Need for distinction between friends v/s everyone else (Need for personal hierarchy)
6. No integration (yet) of camera-based functions like click and send or video call.
7. Lean learning curve – users take time to get acquainted to the terminology
8. Barring initial introduction, understanding of P2P configuration fairly good

Testing (Questionnaire)

Questions	User 1	User 2	User 3	User 4	User 5	User 6	User 7	User 8	User 9	User 10	User 11	User 12	Mean	Sectionwise avg
a.1	3	2	2	3	4	2	2	1	2	1	3	2	2.25	
a.2	2	1	2	2	3	2	1	1	1	2	3	3	1.916667	
a.3	3	3	2	2	3	2	1	2	3	3	2	3	2.416667	
a.4	2	3	3	3	4	3	2	2	3	4	4	3	3	
a.5	1	1	1	2	2	1	1	2	1	2	1	1	1.333333	
a.6	1	1	1	2	1	1	1	2	1	1	1	1	1.166667	
a.7	2	1	2	2	1	1	1	2	1	3	2	1	1.583333	
a.8	4	2	3	4	3	4	5	4	5	3	4	3	3.666667	
a.9	1	1	3	1	4	2	1	1	3	1	2	2	1.833333	2.12962963
b.1	1	2	1	1	3	2	2	3	3	2	1	2	1.916667	
b.2	2	2	3	2	4	3	2	3	4	3	4	2	2.833333	
b.3	4	3	3	2	4	4	3	4	3	2	4	3	3.25	
b.4	4	5	4	5	5	3	5	4	1	3	2	2	3.583333	
b.5	5	5	5	5	5	5	5	5	5	5	5	5	5	
b.6	3	1	2	3	3	3	1	2	2	2	1	3	2.166667	
b.7	1	1	1	2	1	2	3	1	1	1	2	1	1.416667	2.880952381
c.1	1	1	1	1	1	1	1	1	1	1	1	1	1	
c.2	3	1	1	3	5	4	2	1	1	1	2	5	2.416667	
c.3	1	1	1	1	1	1	1	2	1	1	1	1	1.083333	
c.4	2	1	2	3	2	1	1	4	2	1	2	5	2.166667	
c.5	2	2	3	1	2	1	1	3	2	1	1	3	1.833333	
c.6	2	2	2	1	2	1	1	2	1	4	3	4	2.083333	
c.7	5	4	5	5	3	1	2	4	3	1	3	5	3.416667	2
d.1	2	1	2	3	3	2	4	5	4	2	3	2	2.75	
d.2	1	2	2	1	1	1	1	3	1	2	1	1	1.416667	
d.3	1	2	1	1	3	2	2	2	1	2	1	1	1.583333	
d.4	3	2	2	3	1	2	4	2	1	1	3	2	2.166667	
d.5	2	2	4	3	4	2	2	4	5	4	3	4	3.25	
d.6	1	1	1	1	2	2	1	1	1	2	1	1	1.25	2.069444444
e.1	5	3	3	4	3	3	4	5	4	3	2	2	3.416667	
e.2	4	4	5	4	2	5	3	5	4	2	2	4	3.666667	
e.3	5	3	4	4	4	3	2	4	4	3	5	3	3.666667	
e.4	2	2	3	2	2	1	1	3	2	3	2	3	2.166667	3.229166667
f.1	5	4	5	4	5	5	5	4	4	3	3	2	4.083333	
f.2	2	1	3	3	4	3	4	4	3	2	4	2	2.916667	
f.3	4	5	4	5	4	4	4	2	4	5	5	3	4.083333	3.694444444
g.1	1	3	1	1	2	2	1	1	1	3	2	1	1.583333	
g.2	2	2	1	2	1	2	2	1	1	4	2	2	1.833333	
g.3	3	4	3	2	4	3	2	3	2	1	3	4	2.833333	
g.4	2	2	1	1	3	2	1	2	1	1	2	1	1.583333	1.958333333

Testing

Disagree (4)– Strongly Disagree (5)

1. I am likely to make a private shout public to everybody
   → “Need such a system only for friends & relatives”
2. I tend to default to sending messages to friends instead of using shoutbox (uncertainty)
3. I am convergent with the options which appear in the “Advanced settings” option

Strongly Agree(1)– Agree (2)

1. Opening the radar was an easy affair
2. I think my phone acts as a channel for people’s data to travel through and vice versa
3. I can group or combine tags easily and send them to people through the messenger

Limitations:

Environment is not natural to the user

No way to evaluate the genuineness of context through the user’s narration

Difficult to gauge effectiveness / efficiency unless noted in context

(Static Prototype) User’s behavior also depends greatly on the behavior of peers

Refinements



First-use instructor

Testing

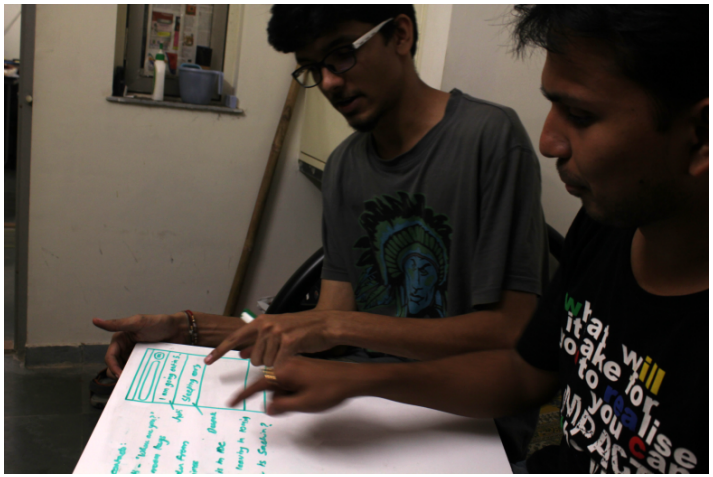
Test 1 : Whiteboard / Flash proto testing

Test 2 : Study of communication dynamics within a peer-circle

Aim:	To gather a crude understanding of the social dynamics likely to arise between Pingle users
Sample Size:	6 Group members revolving around one central user 1 “Pingleboy” accompanying every user, connected by imo.im Bound by proximity in daily life situations Scope of abundant interactions within the group Time span of observation: 2+1 hour Age Group: 22-27 years
Method:	1. Pingleboys act as human versions of the pingle applications 2. Users made to route all communications within group through the pingleboys 3. Pingleboys can only exchange info with other pingleboys and their users

Testing





Within a closed circle in static proximity (hostel floor),

A total of 31 communications were made

4 were not possible to execute using Pingle

Majority (21) were made to either a member of the network or referred to a person within the network

17 of the 21 calls were “critical” – User’s course of action depended on the information obtained

Inferences:

On the basis of crude data, we can broadly note that P2P communication can override conventional call/sms/chat in particular social/proximal setups

Limitations:

Difficult to monitor a complete group on the move in realtime

Non-acquaintances consciously avoid communicating in the presence of an observer

User Stories



Prateek, 20
Shop owner in Sargasan Village

Prateek and his friends like to meet-up every evening to share media and gossip within his circle. Since it is difficult to find songs of their taste on the internet, most of his media is shared by his friends through Pingle. His whole “boy group” likes to go out on bike rides in remote parts of Gujarat, where they can keep in touch even without network. His shop takes orders for delivery via messages passed on by his fellow villagers.

In future, Prateek hopes to add a live network gaming app to his Pingle so that he can be at his shop and still game with his friends.

User Stories





LifeCycle, Pune
Weekend bike-trek group

This cycling enthusiast group organizes long cycling tours involving 8-25 members moving as a cluster along preplanned tour paths (180km) along the Konkan region. They use Pingle to keep in track of all the members of the group and to detect emergency breakdowns because of puncture, health issues, etc. Pingle also helps the leader (Nachiket Joshi) make announcements and easily execute preference polls while on the move.

User Stories



Ravinder, Old Ahmedabad
Very small shop owner

Ravinder's shop is a tiny enclosure deep inside a tiny lane in the thickly populated old city of Ahmedabad. However, it is one of the only photocopy shops in that area, and you would never imagine it being there unless you were told by someone from the bank nearby.

For him, Pingle can play a great role in bringing customers to his doorstep by bridging the gap between the unmet demand and his income. It is a win-win situation for his customers who do not mind paying extra to offset the hassle of having to locate a copy shop.

Conclusion & References

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The slides after this divider will be grouped into a section and given the label you type above. Feel free to move this slide to any position in the deck.

Conclusion

Further Action:

1. Give back to the MANET research community
2. Possibility of an open-source mobile P2P management system
3. Assist network research groups in performing in-depth research
4. Attract user attention towards MANET and P2P applications
5. Interesting to explore methodologies for social interaction design related themes
6. Broader consideration of P2P as a bridge to “internet of things”

Limitations:

1. Difficult to evaluate social interaction design without fully functional backends
2. Functionality greatly affected by the design of algorithms
3. Evaluation only partial due to absence of contexts & functionality within prototype
4. User goals are fluid & changing – difficult to ascertain efficiency

Thank you

Papers

“Beyond Connection: Situated Wireless Communities”
Jun Sun & Marshall Scott Poole, Communications of the ACM, Volume 53 Issue 6, June 2010

“Towards real-time middleware for vehicular ad hoc networks”
Barbara Hughes, Rene Meier, Raymond Cunningham, Vinny Cahill (Trinity College, Dublin) VANET 2004

“Measuring and extracting Proximity in networks”
Yehuda Koren, Stephen C North, Chris Volinsky (AT&T Labs, NJ) 12th ACM SIGKDD international conference on Knowledge discovery and data mining

“A membership management protocol for mobile P2P networks”
Mohammad Karim Sbai, Emna Salhi, Chadi Barakat (INRIA France) ACM New York, NY, USA ©2009

“A P2P based distributed services network for next generation mobile internet communications” Yang Li, Yi Chuan-Wu, Jian-Ying Zhang, Jin Peng, Hong-Luan Liao, Yun-Fei Zhang (CMRI Beijing) WWW ‘09

“Locality support for mobile P2P network”
Heien-Kun Chiang, Hown-Wen Chen, Feng-Lan Kuo (Taiwan) IWCMC ’07

(Great Paper!) “A survey on the applications of MANETs”
Jiazi Yi, Polytech’Nantes; February 2008

Websites

http://www.proxidating.com

http://
www.helsinkivirtualvillage.fi

Mobile Friend Finder:
http://www.mobilaris.se

Wireless Local Communities

Image Credits:
ArpaNET – Computer History Museum
(www.**computerhistory**.org/)

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By
Dhaumya Mehta

Guide
Mooshir Vahanvati

IDC, IIT Bombay