Using Location-Based Social Networks for Crowd Sourced Transportation Systems and Apps


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Outline

Terminology

Motivation

Enablers

Case Studies

Challenges

Recommendations

Flickr.com

discovery.com

iphonebuzz.com

Microsoft

hackingtricks.blogspot.com

prosyn.net

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Location based Social Network (LSBN)

... A social structure made up of individuals connected by the interdependency derived from their locations in the physical world ... a given timestamp and the location history ... [and their] common interests, behavior, and activities
Mobile Crowdsensing Apps

“Mobile crowdsensing applications leverage consumer mobile devices (e.g., smart phones, GPS gadgets, and cars) to collect and share information about the user or the environment, either interactively or autonomously, towards a common goal.”

Source: IBM
Motivation to develop LBSN

• Maximize existing infrastructure efficiency
• Maximize infrastructure utilization by relevant users
• Reduce congestion and pollution in crowded city centers
• Reduce loss of time and valuables (Money, fuel)
• Reduce uncertainty in decision making process (how to go, where to go, ETA, estimated cost)
• Mobile Crowd sensing as a disruptive innovation changing traditional concepts and market inefficiencies
Israel is Start-Up Nation

1. in the world
   - R&D as % of GDP
2. in the world
   - Nasdaq-listed companies (outside of North America)
3. in the world
   - VC investment per capita
4. in the world
   - Engineers per capita
5. ~ 4%
   - Yearly economic growth
6. A+
   - Credit rating

Source: www.TerraVP.com

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Current Work

• Social Networks Applications (SNA) are a new phenomenon that changes the way people take daily decision.

• LBSN are used for various applications: social navigation, parking discovery, geo-social consuming, etc.

• We witness a global success of Israeli sourced GNSS based SNA with increased traction

• What is the LBS vision according to Israeli start-ups?
“If I have seen further it is by standing on the shoulders of giants”

-Sir Isaac Newton

William Blake, Newton, 1795
Source: http://blog.julianlass.com

Augmented Reality in NYC, 2011
Source: http://www.gizchina.com
Enabler 1 - GNSS

- GLONASS announced IOC on GNSS meeting December 2011
- Areas covered with up to 4 systems
- Price, size and power consumption decreasing dramatically

"Global shipments of GNSS-enabled mobile phones are expected to reach 1 billion in 2020. This is driven by increasing attractiveness and affordability of devices ..."

(The Space Report 2011)
Enabler 2 – Internet

- Began in 1960s with rapid acceleration in 1990s
- Services less than “15 years old”: Email, search, Wikipedia, social networks, e-payments, blogging and more
- Major growth in accessibility due to the mobility and network availability

“global websites are now getting more traffic from tablets than smartphones, 8% and 7% of monthly page views respectively.”

(Adobe digital index 2011)
Enabler 3 – Social Networks
Enabler 3 – Social Networks

Increase the speed and reach at which a community can communicate, coordinate, mobilize and use resources

Source: wall street Journal
Benefits of Social Networks

- **Interactivity** – Users can interact and disseminate information in one-to-many and many-to-many forms.
- **Selective distribution** – Information is spread using relevant criteria.
- **Measurability** – Online actions of users can be measured.
- **Documented history** – Actions online can be stored for past analysis.
- **Relevancy** – Request analysis improves the understanding of user needs and personalizes the service offered.
Enabler 4 – Smartphones and applications

- Global shipment of Smartphones reached 1 billion devices representing 25% of total devices
- Devices become faster and stronger in respect of computing power, batteries and display
- High relevance to mobility and GNSS based apps (mapping and navigation requirements)

Apps dominating the mobile communications sphere while usage of standard phone calls and text messages gradually diminish

(source: arabiangazette)
Active sensors in smartphones

- Proximity Sensor
- Accelerometer and Gyroscope
- Hall effect sensor
- Camera and flash
- Microphone for noise
- Ambient light detector

Another diode detects infrared light reflected off the ear, and turns off the display.

GSM/GRPS Front End Module

Front

Accelerometer

Gyroscope

iPhone 5 Camera

Fewt for emergency

Noise canceling top mic

Primary mic

Temperature

iPhone needs to cool down before you can use it.
Apps for iPhone 5

Introducing iPhone 5!

- Plays 3D movies
- 3D video camera
- Washes your cat
- Does your taxes & your hair
- Cleans teeth
- Cosmetical surgery
- Spins straw into gold
- Exfoliation
- Repairs appliances
- Cures flu
- Enables time travel
- Masseuse
- Gives flu to your ex
- Makes you invisible
- Pie on demand
- Makes broccoli taste like chocolate
- Get out of jail free
- Predicts future, changes past
- Controls weather & stock market

*Does not contain a phone.
Enabler 5 - Wide BW Mobile Networks

- Latest developments had made various mobile networks with higher BW available
- Growth in global subscription rate for cellular (114 sub. Per 100 inhabitants)
- Growth in wide BW subscription
- First experiment in social Wi-Fi

Cellular Subscriptions

Broadband Subscriptions

Source: ITU
Timeline of Major Technology – focus on the last 2 years

**Social Networks**
- **Facebook**
  - 600M -> 1B Users
    - Jan 2012-> Oct 2012

**Internet**
- **Google**
  - 25K+ active contributors/month
    - Q1 2012
  - Google purchase MMI

**GNSS**
- **GLONASS IOC**
  - 2011
  - GLONASS accuracy<2.8m
    - 2012

**Mobile & Cellular**
- **Dual GNSS iPhone 4S**
- **Quad Core Galaxy S3**
- **Octa Core Galaxy S4**
- **ZTE U956 Quad Core For 240$**
- **ZTE Blade 3.5 w/ A-GPS for $140**

- **Baidu IOC over AP**
  - Dec 2012

- **GIOVE-A High altitude fix**

- **2011**
  - GLONASS IOC 2011

- **2012**
  - GLONASS accuracy<2.8m 2012
  - Baidu IOC over AP 2012
  - 5 in 1 GNSS chip 2013

- **2013**
  - ZTE Blade 3.5 w/ A-GPS for $140

**Other Technologies**
- **foursquare**
  - 20M users
  - Q1 2012
  - 2B check ins
  - Q1 2012

- **waze**
  - 36M users
  - Q4 2012

- **OpenStreetMap**
  - 25K+ active contributors/month
  - Q1 2012

- **Smartphones and tablets Sourced from**
  - 20% of internet surfing
  - Around $140
Case study A – Waze
crowd-sourced traffic and navigation app.

The Need: Get fastest navigation rout to destination based on real time information

Social features: passive speed & location contribution, alerts, ride update, pick me up and more is coming

When drivers work together the road ahead gets a little brighter

(source: Waze)
Waze -traction

Waze won the Best overall mobile app. Preferred over Dropbox file hosting service, Flipboard news application, Sky Sports F1 and the Square electronic payment service.
Case study B – Moovit
crowd-sourced public-transportation information system

The need: get fastest relevant public transportation route.

The environment:
7B people in the world only 900M cars; in NY people commute 12.5 days and 1.5 days delayed per year.

Public transportation as percent of motorized trips
Source: Publictransportation.org
Case study B – Moovit

The solution: Multilayered real-time information system based on PT agencies data and crowd sourced information based on passive contribution of users

Benefit: accurate ETA

Social features: passive location contribution, bus occupancy
Case study B – Moovit
crowd-sourced public transportation information system

Traction: 31 countries

1M downloads (Q1 2013)
Case study C – sPARK
Crowd sourced parking discovery system

- The need: drivers lack the ability to navigate toward an urban destination while taking optimal parking decision
- Market: Drivers in crowded cities
- Solution: Platform and app. That enables best route to closest cheapest parking
- Benefit: reduced congestion, pollution; reduce time loss and frustration, maximizes use of resource in shortage
- Social features: passive contribution, share a spot, double hitch hike
- Traction: N/A

Source: sPARK

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Case study D – Get Taxi

Virtual taxi station

• Need: inefficient service of offline taxi stations
• Market: $31B global spending
• LBS features: closest taxi, fastest route, immediate feedback, lost baggage, mPayment

Source: Get Taxi
Effective use of infrastructure

Run-in time between passengers

4 KM  ORDINARY TAXIS

1 KM  GETTAXI DRIVERS
Case study D - Get Taxi

At peak times:
1 GetTaxi ride every second

- $30 million in funding
- 170 employees full-time equivalents
- 1,500+ enterprise clients around the globe
- 6,000+ taxis running on GetTaxi technology
- 1,000,000 downloads for mobile devices
- 20 cities in four different countries
Case study E – iOnRoad

• The need: real time alerts on driving
• Market: 900M cars and drivers
• Solution: User app. Based on GPS combined with advanced Image processing features of built-in camera, accelerometer and gyroscope
• Benefit: real-time feedback on driver behavior enables pre accident reaction
• Social features: share your driving behavior (Car owner, insurance)
• Traction: 1M downloads
• Company was sold to Harman for amount estimated at $10M

Source: Ion road
The industry

Openstreetmap platform 1M active users 30000 contributors per month

Moovit
1M Users $3.5M

Waze
36M Users $67M

GetTaxi
1M Users 29.5M $
Case study F – fuel Monitor

• The need: real time evaluation tool for driving efficiency
• Market: 900M cars and drivers
• Solution: User app. Based on GPS tracker with real-time car specific lookup table
• Benefit: real-time feedback on driver behavior enables fuel consumption reduction
• Social features: share your journey data
• Traction: 100K users globally

Source: fuel monitor
Case study G – Waybetter

Share Taxi ride platform

- The need: Private taxi drive is relatively expensive while most drives take only a single passenger.
- Market: 22K licensed taxis (LNDN).
- Solution: shared rides platform and app.
- Benefit: Cost Reduction of 30-60%.
- Social features: share your journey.
- Traction: N/A.

Source: WAYbetter
Case study H – Buzzjourney
Share Taxi ride platform

• The opportunity: 1.3 people in every commuters car. Meaning, there are 3 empty seats in every car.
• Market: 154M Daily commuters. who travel 1.5B Km annually
• Solution: Platform and app. That enables location based drive sharing
• Benefit: reduced congestion & pollution; reduce commute cost
• Social features: share your journey with the community

Source: Buzzjourney
Important notes

• All apps presented are free for users thus enable anyone with smartphone to become a user.
• “when the product is free, you are the product” so users must contribute something usually privacy, passive or active feedback or “face time” for targeted commercial content.
Challenges

• Receive initial traction in order to establish minimal valuable service (chicken-egg problem)
• Monetization of the social networks
• Privacy issues are concern by regulators users and commercial entities (Apple, Google, Microsoft etc.)
• Gapping the digital divide
Recommendations

• Application development level
  – Support entrepreneurs by providing initial data
  – Prizes and contests
  – Approach app developers with global traction

• Increase Awareness Programs
  – Provide citizen with info. on social apps trough conventions, media, blogs and portals
  – Train government authorities and decision makers to learn public behavior through social apps
Recommendations

• R&D for knowledge gaps
  – Deepen crowd sensing R&D
  – Promote local research on Information flow and user behavior

• Government Initiatives and International Agreements
  – Constructive and proactive dialog with major social network companies
  – Improve network availability and promote use of smartphones
  – Encourage innovation by seed funding
Summary

• LBSN are changing the way we consume transportation related services
• LBSN receive growing traction by users but we are still at the beginning phase.
• Technology development lowers the barriers for user adoption.
• Israel became an industry leader in LBSN and location based apps.
• User adoption will result in reduced resource consumption and greater infrastructure efficiency
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Thank You!

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