No “one-size fits all”
Towards a principled approach for incentives in mobile crowdsourcing

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Background

- Mobile crowdsourcing
  - Participatory/mobile sensing
  - Mobile micro-labor
  - Traffic Monitoring

- Various requirements
  - Spatial coverage
  - Temporal response
  - User attentiveness
  - User participation
  - ...

No “one-size fits all”

Different applications weight them differently
Incentives and mobile crowdsourcing

- Why incentives?
  - ↑ spatial coverage, user engagement, contribution

- Types in desktop crowdsourcing
  - Micro-payments
  - Beyond money
    - altruism, enjoyment, reputation

- Types in mobile crowdsourcing
  - Micro-payments
    - Micro-labor
  - Altruism and social rewards
    - Participatory sensing

Ad-hoc, one-off solutions

No “one-size fits all”
Goal: Build a framework

Compare and characterize incentive mechanisms

- *How to evaluate?*
- *Do users react differently?*
- *Tradeoffs?*
- *Best fit for application?*

→ This work

- Experimentally derive characteristics of two incentive structures that help answer these questions
Dimensions of incentives

Reward Magnitude
- More/less money for the same job, pricing

Reward Type
- Class of reward offered: monetary, game credit, “sweat-equity”

Reward Structure
- How rewards are distributed: Pay-per-task, base salary + bonuses

Best Fit Incentive

No “one-size fits all”
Experiment: Evaluate two incentives

- **Micro-payments**
  - Guaranteed payoff

- **Weighted Lottery**
  - High risk : High reward
  - 20 winners, limit one per user

- **Varied only structure of reward**
  - Chose one deterministic and one probabilistic incentive structure for comparison

No “one-size fits all”
Experiment application

- Microsoft TechFest 2013
  - Two days, two 5-hour sessions, 151 booths, >3000 visitors
- 50 Phones – scavenger hunt application
  - 10 clues → Match clues to booths
  - Scan booth’s 2D barcode to complete

No “one-size fits all”
Measuring impact of structures

1. Recruitment – Attracting users to campaign

2. Compliance – Users completing tasks correctly

3. User-Effort – Amount of effort/time users are willing to put into each task
Results preview

- Micro-payments
  - Fewer, more productive users
- Weighted Lottery
  - More total tasks, less individual effort
1. Recruitment: greater with weighted lottery

- **Micro-payments**
  - Lower overall recruitment
    - Recruited 39 participants
    - 23 active participants
  - Lower expected payout
  - Lower willingness to participate

- **Weighted Lottery**
  - Higher recruitment
    - Recruited 57 participants
    - 39 active participants
  - Lure of low cost/high reward
    - Expected payouts favorable given low initial effort

No “one-size fits all”
2. Compliance:

- Micro-payments
  - 99 completed
  - Each user completed twice the number than weighted lottery (median)

- Weighted Lottery
  - 120 completed
  - Fewer tasks completed per user

No “one-size fits all”
2. Compliance: no correlation with popularity

- Are users willing to go “out of their way”? 

![Graphs showing Micro-payments and Weighted Lottery](image-url)
3. **User-effort:** micro-payments = more engaged

- Time between first and last completed task
  - Most weighted lottery participants had much shorter active sessions
3. User-effort: spatial coverage

Micro-payments

Weighted lottery
3. User-effort: spatial coverage

Micro-payments

Weighted lottery

Fewer users but higher Coverage!
Results summary

- Weighted Lottery
  - More total tasks, more users, less individual effort

- Micro-payments
  - Fewer, more productive users
Discussion and Future Directions

- Further understand role of incentives for behavior change
  - Humans becoming integral parts of mobile system performance

- Incentive choice affects different aspects of user behavior

- Larger study for further characterization

Thank you!