Motivation & incentives in crowdsourcing platforms

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Overview

• Self-determination Theory
• Motivation in Crowdsourcing Systems
• Incentives for Crowdsourced Language Learning
• Incentives for Geofenced Mobile Crowdsourcing
Self-determination Theory
Self-determination theory

- Psychological needs for motivation

Competence  Autonomy  Relatedness

Motivation in Crowdsourcing Systems
Paid Crowdsourcing: MTurk

- 431 participants are online workers who perform different micro-tasks
- Top motivating factors
  - Payment (external, extrinsic)
  - Task Autonomy (internal, intrinsic)
  - Skill Variety (internal, intrinsic)
  - Task Identity (internal, intrinsic)
  - Human Capital Advancement (internal, intrinsic)

Paid Crowdsourcing: MTurk

• 158 participants are online workers who perform different micro-tasks
• Top motivating factors
  • Payment (external, extrinsic)
  • Help others (internal, intrinsic)

Paid Crowdsourcing: Threadless

• 17 participants were t-shirt designers
• Top motivating factors
  • Making money (external, extrinsic)
  • Improving creative skills (internal, extrinsic)
  • Freelance opportunities (external, extrinsic)
  • The love of community (internal, intrinsic)
  • Addiction (internal, intrinsic)

Crowdsourcing Contests: SAPliens

- 39 participants who submitted solution ideas to solve design challenges
- Top motivating factors
  - Appreciation by the organizer (external, extrinsic)
  - Prizes (external, extrinsic)
  - Career options (external, extrinsic)
  - Access to knowledge of experts (external, extrinsic)
  - Access to knowledge of mentors (external, extrinsic)

Crowdsourcing Contests: IdeasProject

- 244 participants who submitted solution ideas to solve challenges
- Top motivating factors
  - Learning benefits (internal, extrinsic)
  - Recognition from host companies (external, extrinsic)
  - Hedonic benefits (internal, intrinsic)
  - Social benefits (external, intrinsic)
  - Recognition from peers (external, extrinsic)

Crowdsourcing Contests: Taskcn

- 283 participants were who solutions to solve various design contest
- Top motivating factors
  - To gain recognition (external, extrinsic)
  - Task variety (internal, intrinsic)
  - Task autonomy (internal, intrinsic)
  - Task analysability (internal, intrinsic)

Crowdsourcing Contests: Taskcn & Zhubajie

- 420 participants were who solutions to solve various type of contests
- Top motivating factors
  - External motivation (External, extrinsic)
  - Introjected motivation (External, extrinsic)

Crowdsourcing Contests: Taskcn

- 156 participants were who solutions to solve various type of contests
- Top motivating factors
  - Work autonomy (internal, intrinsic)
  - Monetary reward (external, extrinsic)
  - Skill enhancement (internal, extrinsic)
  - Enjoyment (internal, intrinsic)

Volunteered Crowdsourcing: Tomnod

• 166 participants are volunteers who identify objects in satellite images
• Top motivating factors
  • Help people and environment (internal, extrinsic)
  • Educational (internal, extrinsic)
  • Easy to do (internal, intrinsic)
  • Fun (internal, intrinsic)
  • Given recognition for contribution (external, extrinsic)

Volunteered Crowdsourcing: Eyewire

- 1505 users of the Eyewire platforms for understanding the structure of neurons in MRI scans of human brain
- Top motivating factors
  - Contributing to the project (internal, extrinsic)
  - Helping improve scientific knowledge (internal, extrinsic)
  - For the entertainment value (internal, intrinsic)
  - To learn about science (internal, extrinsic)
  - For some personal interest towards Eyewire (internal, intrinsic)

Incentives for Crowdsourced Language Learning
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Language Teachers

Explicit Crowdsourcing

Language Experts

Implicit Crowdsourcing

Language Learners
Explicit Crowdsourcing

- Crowdsourced task
  - Creation of learning material for language learning
- Language teachers
  - Generate learning material
  - Generate evaluation material
- Language experts
  - Design and evaluate learning strategies and methods
Implicit Crowdsourcing

- Crowdsourcing task
  - Perform lessons and provide feedback
  - Provide text or multimedia datasets
- Language experts and teachers
  - Evaluate the effectiveness of lessons
- Language learners
  - Rate the effectiveness of lessons
Suggestions??

- Learning material generation
  - Rewards (Mturk, Upwork)
  - Recognition (Duolingo)
  - Contests (Taskcn, Kaggle)
- Language learning and datasets
  - Game with a purpose (RoboCorp)
  - Gamification (Duolingo, Eyewire)
Incentives for Geofenced Mobile Crowdsourcing
Geofenced Mobile Crowdsourcing
Assignment Protocol
Research Challenges

• How to address the trade-off between notifications and coverage?
  • Small geofence -> less coverage
  • Large geofence -> more notifications

• How to tackle the task starvation problem when tasks expire without being completed by any worker?
  • Tasks at less visited locations
  • Rewards value related to task completion
Geolife Data

- 17,621 GPS trajectories of the 182 users from April 2007 to August 2012

- Variety of user movements such as
  - travel to home,
  - travel to work,
  - shopping,
  - sightseeing,
  - dining,
  - cycling, etc.
Dynamic Geofencing

- The size of geofence depends on the diversity of visits to a location.
  - Density
  - Entropy
- More diverse location means smaller geofence size.
Dynamic Geofencing

![Graph showing TNR and Coverage for Fixed, Density, and Entropy cases for different values of n.](image-url)
Dynamic Pricing

- Post-price incentive mechanism
- At time $t$, price tasks according their likelihood of completion by assigned workers.

$$r_i^t = r_0 + B_t \frac{\omega(\zeta, j, t)}{\sqrt{V}}$$
Dynamic Pricing

• For fixed number of tasks and fixed geofences.

• Dynamic pricing achieves high completion rate compared to fixed pricing.
Thank you.

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