

Incentives Research tutorial

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Outline

- It all starts with motivation
- The basics of motivation
- Extrinsic and intrinsic motivation
- Incentives and their role for extrinsic motivation
- Leveraging intrinsic motivation



Starting with motivation

- Basic tenets of organizational behavior:
 - Performance : $f(\text{ability} * \text{motivation})$
 - Incentives \rightarrow Motivation \rightarrow Performance
- What is motivation:
 - Psychological meaning: internal mental state pertaining to initiation, direction, persistence, intensity and termination of behavior
 - Managerial meaning: activity implemented to induce others to produce results



Basics of motivation

- Many theories: content and process theories
- Recent approaches stress:
 - The importance of involvement (Goal-setting theory)
 - The relevance of perceived fairness
 - Features of the task in terms of feedback/visibility opportunities (social/interactive elements of tasks to be performed)
- Common trait: relationship between task and motivation



Extrinsic and intrinsic motivation

- Motivation needs to be extrinsic if task is considered:
 - Boring, dangerous, useless, socially undesirable and generally speaking dislikable by the performer
 - In order to make an individual/team perform (well!) there is a need for (external) incentives (general idea behind salaries and monetary compensation in general).
- Motivation is intrinsic if:
 - The performer likes what he/she is doing
 - The act is satisfying in itself (it can happen for many different reasons)



Extrinsic motivation and incentives

- Incentives: “rewards” assigned by an external “judge” to performer to make him/her commit
 - Can be totally uncorrelated to the nature of the task (typically there is a partial correlation)
 - Need to be interesting for the value/beliefs of the acting person
 - Are given “in exchange for” work (i.e. money)
- Common belief (among economists): can be translated into a sum of money for all practical purposes



Two main traditions

1. Research on incentives (of an economic, extrinsic nature)
2. Research on the nature of tasks (of a social, intrinsic nature)
 - We (UNITN-DISA with an emphasis on 1, Siegen with an emphasis on 2) are going to deal with both aspects.
 - Caveat: as you will see this concepts are analytically different but, in fact, intertwined.



Tradition 1: the economist's perspective

- General object:
 - Alignment of interests between parties and production of maximum social welfare
 - Tool: production of an institutional setting (read set of incentives) promoting alignment
- Typical cases of interest:
 - Regulation of markets (auctions, labor markets, public goods)
 - Corporate environments (principle-agent, between-group competition/emulation)



Regulation of markets: mechanism design

- Tools: game theory, experimental and computational economics (Roth, 2002)
- Main practical design successes:
 - Medical labor markets (Roth, 1984; Roth & Peranson, 1999)
 - “Dutch auction” for selling radio/cell phone frequencies (Maskin & Riley, 1984; Klemperer, 2002)
 - Organ donor matching (exchange of relative-donor) (Roth, Sonmez & Unver, 2007)
- Generally speaking: rules of the game have an impact in selecting the best/matching the fittest in competitive situations.



Corporate environment: principal-agent mechanisms

- Tools: game theory, experimental economics
- Main tenets:
 - a **principal** has interests but does not want/cannot produce
 - He/she employs **agents** who produce. Producing is costly to the agent.
 - principal needs to compensate the agent in order to benefit from production: incentives to align interests.
 - Interesting case: principal cannot observe agent's effort.
- Main practical success: HR practices, franchising contracts, unlimited liability sub-contracting to main contractor, decentralization/hierarchy dilemma) (Mookherjee, 2005; Poitevin, 2000)



Stylized facts on peer-contributed content

- Power law distributions :
 - F/OSS software (Lerner & Tirole, 2005)
 - In institutionalized tagging, delicious
 - (Cattuto et al., 2007) [tags and posts]
 - (Golder & Huberman, 2006) [tags and users]
 - In private content platforms (Xerox Eureka: Bobrow and Whalen, 2002)
- Variance:
 - Relevant differences in richness of human produced semantics
 - Stability in the relative use of tags → consensus (along Polya urn limit distributions)



Applications of incentives research to peer contributed content

- Motives for Wikipedia contributions (Johnson, 2008):
 - Credit of authorship as reward (Forte and Bruckman, 2005)
 - Altruism, reciprocity, community, reputation, and autonomy (Kuznetsov, 2006)
 - “Mixed motives” - selfish and altruistic motives – (Wagner and Prasarnphanich, 2007)



Applications of incentives research to the tagging domain proper

- MovieLens field experiment (Chen et al. 2008):
 - social comparison on contributions helps spur contributions
 - personalized information spurs contribution
 - Comparing benefits and costs helps
- “Common grammars” experiments (Selten & Warglien, 2007):
 - too small repertoire of tags causes coordination failures
 - Cost efficiency and role asymmetry are important factors enhancing communicative success
 - In stable environments, grammars do not matter much, and instead efficient arbitrary codes often do better.
 - in novel environments, compositional grammars offer considerable coordination advantages and therefore are more likely to arise



Focus on the MovieLens case (i) (can illustrate method and results)

- MovieLens makes “predictions” on user preference based on other user’s recommendations
- Problem: underutilization (significant numbers are required to work)
- Peer contribution & large amounts of behavioral information available. Lit. predictions:
 - Information on “median” behavior → tendency to conform
 - Information on other individuals → tendency to reduce payoff inequality



Focus on the MovieLens case (ii)

- Method: field experiment
 - Randomized sample of 398 users with 30 or more reviews
 - Random money prize assigned to participants
 - Divided into 3 experimental groups:
 - Personal newsletter 1: median number of contributions
 - Personal newsletter 2: net benefit (benefit-cost in time) of average user in own cohort
 - Control
- Stage one: pre-experimental survey to estimate benefits in membership



Focus on the MovieLens case (iii)

- Stage two: newsletter is sent suggesting two kinds of behavior
 - Improve your net benefit score
 - Spur others to improve net benefit
- Stage three: re-run survey
- Model for net-benefit (benefit – costs)
- Benefit: $f(\text{Quality, Fun, NonRating activities})$
- Cost: $f(\text{Time, Rare movie})$



Focus on the MovieLens case (iv)

- Use function to compute net-benefit
- Results:
 - Relative Info: below-median users contributed 530% more, above-median 62% less! → conformity strikes!
 - Net benefit: below-median users contribute more “easy” (popular film) reviews (selfish behavior); high contributors contribute even more: altruistic motive.



Dimensions for characterizing cases in the project...

- Generally speaking tagging belongs to “cooperative games”
- Public goods: non-rival (use does not limit use of others), non-exclusive (open access)
 - E.g. Wikipedia
- Private goods: rival, closed
 - E.g. This copy of MS Powerpoint.
 - With principals and agents possessing strongly asymmetric information
- Two very different situations



...mixed motives and pure coordination

- Mixed motives (private-corporate)
 - General interest for the individual is to generate and consume the good
 - Private interest: work as little as possible as long as good is generated
- Pure coordination (free-open)
 - interests are already aligned
 - Private and public benefit coincide
 - matching



Tools, methods, goals

- Goal: to design integrated systems promoting user contributed contents of good quality
- Methods: Ideally field → desk → lab → field
- “Requirements”:
 - We need strong input from the industrial partners to make things work: need to be extra-sharp in characterizing the cases.
 - Feedback and fine-tuning are crucial steps: this is non-trivial!