

Mechanism design
for creation of common good:
How to work together
for the good of the industry

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The Case of Gathering Acting Together

- **Setup:** Industry gathering of businesses in the industry
- **Incentive:** Outside entities, individuals, phenomena and factors pose more threat to a gathering members to each other as competitors. Members can greatly benefit from cooperation by obtaining competitive advantages against outside world in sharing business information with each other
- **Mechanism?** We can either make all members to participate, or convince them all to achieve consensus, or carry out less than global initiative with motivated core nucleus of participants



- How we do our business
- How our clients want us to do it
- How it can be done better inside
- How we can ease interactions
- How can we open new opportunities



- Increase volume of business
- Get free training from colleagues
- Be more attractive
- Build industry service platform
- Increase visibility
- Get more weight in getting to clients

Standards Adoption Benefits

- Decrease internal cost of doing business 
- Decrease typical business risks 
- Facilitate business interactions 
- Increase maturity level 
- Increase both perceived and real value of services to clients
- Develop internal processes 
- Build standard internal systems 
- Grow business 
- Save on R&D and business development 
- Save on internal personnel training 
- Get common reference point to use and present as a proof 



Chasing problems (Quiz)

Showing the Standards Money

What deficiencies are frustrating and cause or induce losses (of time and money)?

- Debating about and defining what to do (task definitions)?
- Communication problems?
- Quality definition or assessment?
- Agreeable financial metrics and rates?
- Legal processes?
- Translation process methodology?
- Terminology management?
- ...anything else?

Working together means sharing your Private Information

Poll on the key Hot Buttons:

- What is that you have organized best, are proud of, and ready to share (process, contract, practice)?
- What are three biggest problems of your business, what is that you are dissatisfied with?
- ...and what help you might need?
- What savings/improvements you might be interested in?

Standard:

Product of many different participants that form interest group to obtain mutual gains in coordinated action **IF** they ensure a:

- 1) group-wide **uniformity in a measure** a
- 2) **level of quality** or attainment, a
- 3) **rule, test or requirement**.

Misfortune of Standards

- There are too many private standards
- Private standards are used to obtain and preserve competitive advantage
- There are too few generally adopted public standards
- Standards compete
- Standards are costly and difficult to develop
- Winning standards are not always the best ones
- Standards may be strong (mandatory), and may be “weak”
- Standards are “the problems of the day after tomorrow” – today and tomorrow are more important; the benefits of participation are unclear and hardly measurable
- **Standards are very difficult to develop collectively. WHY?**

WHY STANDARDS FAIL?

WHY STANDARDS HARD TO DEVELOP?

HOW TO DEVELOP PUBLIC STANDARDS?

Standard is a “Public Good”

- ...is provided for users collectively
- ...use by one does not preclude use by others

Standards = Public Good

...provision of public good is a classic problem of economic theory



Nobel Prize Breakthrough Economic Theory Approach

- Mechanism Design theory is a breakthrough on the level of Einstein and Adam Smith.
- Social problems are non-cooperative games
- Institution is a communication system
- Goal is Pareto efficiency:
No one can be made better off without making someone else worse off.



The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2007

"for having laid the foundations of mechanism design theory"

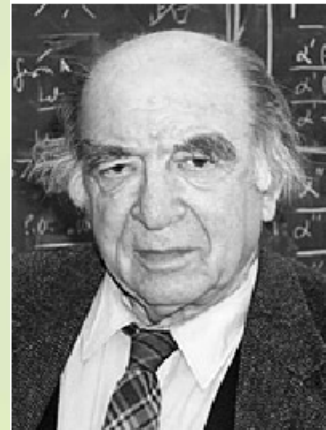


Photo: Dong Oh

Leonid Hurwicz

🏆 1/3 of the prize

USA

University of Minnesota
Minneapolis, MN, USA



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Eric S. Maskin

🏆 1/3 of the prize

USA

Institute for Advanced
Study
Princeton, NJ, USA

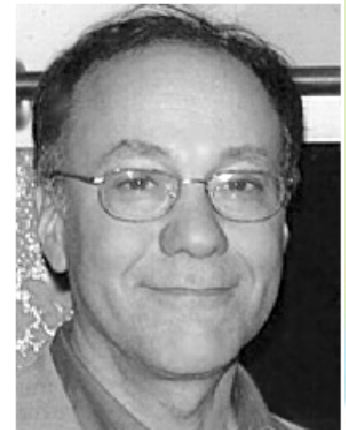


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Roger B. Myerson

🏆 1/3 of the prize

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Problem of Public Goods Provision

- When individuals have Private Information about their own willingness to pay for the public good, they are tempted to pretend to be relatively uninterested, so as to reduce their own share of the provision cost.
- Before 1970, economists generally believed that public goods could not be provided at an efficient level, precisely because people would not reveal their true willingness to pay.

Hurwitz, 1972: Individualism works against public goods

- «No mechanism with Pareto-optimal outcome exist In in an exchange economy with dominant strategy for agents is to report Private Information truthfully».
- If dominant strategy for each agent is made (by force) to report his Private Information truthfully, optimal design is Dictatorship (one of the agents, “enlightened dictator”, is making a decision to create a common good regardless of what others think).
- **Private information precludes full efficiency**



- But even without full efficiency, how large the unavoidable social welfare losses are, and what the appropriate standard of efficiency should be. More generally, we would like to know what kind of mechanism will maximize a profit or social welfare (whether this outcome is fully efficient or not)?
- These questions have been answered with discovery of Revelation Principle, stating that any arbitrary mechanism with equilibrium can be replicated by an incentive-compatible direct mechanism (where the strategy is to report information truthfully).

When individuals have private information about their own willingness to pay for the public good, they may be tempted to pretend to be relatively uninterested, so as to reduce their own share of the provision cost. This problem is canonical and arises in virtually all societies: how should a group of farmers, say, share the cost of a common irrigation or drainage system; how should the countries in the world share the cost of reducing global warming; how should grown-up siblings share the burden of caring for their elderly parents? Before 1970, economists generally believed that public goods could not be provided at an efficient level, precisely because people would not reveal their true willingness to pay. It thus came as a surprise when Clarke-Groves demonstrated in 1971 that:

- IF there are no income effects on the demand for public goods (utility functions are linear = the value of goods is equal to all participants),
- THEN there exists an incentive-compatible class of mechanisms in which (a) truthful revelation of one's willingness to pay is a dominant strategy, and (b) the equilibrium level of the public good maximizes the social surplus (mechanism is incentive efficient).



- Each agent is asked to report willingness to pay for the project.
- The project is undertaken if and only if the cost of the project is lower than total willingness to pay.
- If the project is undertaken, each agent pays the balance between the cost of the project and everyone else's reported total willingness to pay.
- With such "taxes" each agent "internalizes" the total social surplus, and truth-telling is a dominant strategy.



- CGM violates budget balance: total tax revenue will not add up to project cost; and excess of the funds either destroys agents truth-telling incentives, or waste of surplus makes mechanism inefficient.
- CGM is optimal only if value of public good consumption is the same to all agents. When it is different to participants, then again the only dominant-strategy mechanism is Dictatorship.
- Because of this and other negative results, the focus of the research shifted from dominant strategy solutions to so-called Bayesian mechanism design.

- Agents are expected utility maximizers. The solution is a Bayesian Nash equilibrium. The incentive compatibility constraints only have to hold in expectation. That is, we now do not require participating companies to tell the truth, but only expect them to do so.
- Produces results that are fully Pareto efficient.
- BUT these mechanisms violate interim IC constraints → some agents having observed their PI would prefer not to participate, so **the mechanism is feasible only if participation is mandatory.**
- If participation is voluntary and decisions to start the project must be taken unanimously, free-riding destroys the project. **Asymptotic probability of funding the public project is zero despite everyone knowing that they can be jointly better off if the project is funded.**

Negative conjectures about public goods provision

- These results give a plausible explanation for observed failures to provide public goods. For example, the fact that English villages were much earlier than French villages in deciding on public goods such as enclosure of open fields and drainage of marshlands can arguably be ascribed to the fact that French villages required unanimity on such issues whereas the English did not.
- And yes, nowadays these results are directly applicable to joint projects in Internet era, such as standards efforts and their successes and failures.

- Private standards are much easier to develop
- **Public standards development effort can be started with Clarke-Groves mechanism IF:**
 - budgeting is efficient, (all collected money are spent efficiently, no private gain is suspected), OR
 - value of standard is the same to all agents (no clear difference in value must be perceived or expected), OR
 - perceived value of shared Private Information is Zero
- **OTHERWISE:**
 - **No unanimous decision of association members must be required to launch standards development effort** (there must be decisive Committee), or
 - **Participation in standards development effort must be mandatory for all association / industry members**

Consequences for Public Standards

- Implement mandatory participation (Bayesian);
- Implement “under-participation” tax (Clarke-Grooves);
- Implement ultra-economic budget (so as to use what means are feasible to collect);
- Sell PR, not support (GSI logo);
- Invoke non-monetary participation with non-financial drivers (Wiki) – Marcom, R&D, PR;
- Implement “pay-for-play” projects (directly beneficial for the funders)
- **Long-term implementation strategy is a must**, over time the on-going effort will increase common Goods IP and increase the weight of all these drivers over time, creating the new, public IP and “goodwill” (the “Name of Wiki” effect, the weight and value of public content, public project and public platform and vehicle).