ICIS 1997 Proceedings

International Conference on Information Systems
(ICIS)

December 1997

Mechanism Design for Intellectual Property Rights Protection

P. Giridharan
National University of Singapore

Aravind Srinivasan
National University of Singapore

MECHANISM DESIGN FOR INTELLECTUAL PROPERTY RIGHTS PROTECTION

P. S. Giridharan
Aravind Srinivasan
National University of Singapore

Estimates for the annual size of software piracy are in the region of $15 billion. The problem is also manifest in other forms of intellectual property. The explosive growth of the Internet and other communications networks has accentuated this problem. The new infrastructure has facilitated piracy by effectively reducing the cost of copying to negligible levels. (Recently, the FBI launched an operation called "Cyber Strike," with the objective of curbing illegal copying and distribution of software over computer networks.) A naive suggestion has been that intellectual property rights (IPR) violation is actually beneficial from the social point of view, since it decreases the monopoly power of the provider. However, the flip side of this argument is that the IPR violations decrease the incentive for innovation because they lead to lower profits. In this paper, several mechanisms for IPR protection are designed. The mechanisms involve two tools: the level of enforcement (i.e., the probability that an IPR violator will be apprehended) and the penalty to be levied on an apprehended IPR violator. These tools are analyzed by considering the tradeoff between social welfare and the provider's profit. The paper considers a provider who wants to maximize his profit and a policy maker who wants to maximize "net" social welfare (defined as welfare less any costs of enforcement), subject to a target profit for the provider. The consumers choose from among three options: buy, copy, or stay out of the market. A game-theoretic framework is adopted, where the policy maker, the provider, and the consumers get to move in that order. Among the results, the research shows that

- The number of units sold is independent of the mechanism set up by the policy maker; in fact, the provider should sell the same number of units as under a no-copying situation and if he does not, he should know that his price is not optimal.

- There are situations where the provider stands to lose as the level of enforcement is increased beyond a certain limit (which is derived).

- There are situations where the society stands to lose as the level of enforcement is decreased below a certain limit (which is derived).

- The penalty level decision is a powerful tool in the hands of the provider, with which he can completely recover the monopoly situation, but yet it is pareto optimal for the social planner to hand over this powerful tool to the provider under certain situations (which are derived).

- If the social planner wants to share the tasks of setting the enforcement level and the penalty level with the provider, there is a separation result (that is derived) for who should perform which task.

The extensions are also described.