

**Development of a Knowledge Market Based on Reputation
and Absorption of Uncertainty in Electronic Commerce**

Hitoshi YAMAMOTO

Science University of Tokyo (JAPAN)

Toshizumi OHTA

University of Electro-Communications (JAPAN)

Introduction

Goals

Understanding character and the mechanism of Cyber Commons

Analyzing role of reputation in knowledge marketplace

Background

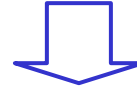
Development of network and emergence of cyber commons

Emergence of knowledge exchange marketplace

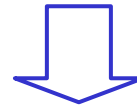
Social dilemma in virtual community

Development and Issues of Cyber Commons

Socialization of Network & Networking of Society



A new information sharing space is emerging auto-genetically



Development of Cyber Commons

Mailing list, BBS : **Knowledge Exchange Market**

File Sharing, Information Sharing: Gnutella, Napster

Free software, Share ware : **Linux Community**

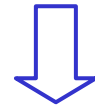
**What are the character and the mechanism of
Cyber Commons?**

Necessity of Human Resource in Network

Explosive increase in the amount of information



The limit of man's information processing capability



Necessity of utilization human resources on a network.

Reputation	e-bay , K-square
Relation	Linux community "Let's note" community (Panasonic)
Recommendation	About.com Amazon.com

Study of Cyber Commons

Free Rider
Circulation and Creation of Information
Economical Utility of Reputation



Social dilemma in information space
Influence of free rider

Difference of Traditional Commons and Cyber Commons
Classification of Cyber Commons

Reputation in knowledge marketplace

Understanding of mechanism of cyber commons

5 To design information circulation and repositories as social infrastructure

Background of Cyber Commons

The changes of social systems by network

interactive information chain	People came to be able to display and send information People customize the information to receive
the asymmetry of information	A consumer can access all information A supplier cannot maintain predominance by having many information
community business	A spontaneous community emerges and carries out the management value
physical restrictions	Internet overcomes restrictions on communication based on geography, time, and opportunity.

Information Circulation and Goods

When information circulation is bounding to physical restrictions strongly

An information goods can be dependent on the rareness of a goods

Development of information circulation (before network society)

protection a reduction of the rareness of a goods by copyright

Development of information circulation (network society)

Information circulation cannot be dependent on a physical restrictions

It is contradictory in the framework of present copyright



clearly circulating reputation

Social Dilemma in Commons

Commons : Tragedy of Commons (Hardin)
Cyber Commons : Bandwidth of Network (Kollock,Smith)

Rational action of an individual
Irrational result as the whole



The distribution of limited resources

An argument which made information space
result in the rareness of material

The distribution problem of resource



The sharing problem of information

Cyber Commons and Traditional Commons

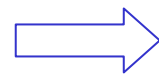
Difference between Commons and Cyber Commons

	Commons	Cyber Commons
Free Rider	The negative member not avoided	The negative member not avoided
Management	Distribution	Sharing

Gnutella: 98% of a share file is provided by 20% of the participant. (Huberman,2000)

Knowledge Sharing in an Enterprise : Motivation of information sharing is difficult.

Resource insufficient by over consumption



contribution to distribution

Supply insufficient by free rider



contribution to the submission and sharing

Two Forms of Cyber Commons

An argument of a free rider's utility in ML and BBS (Endo,2000)

Linux community does not receive a free rider's bad influence(Raymond,2000)

Two characteristics of the social influence of a free rider

Two Forms of Cyber Commons		
	Cyber Commons for Circulation	Cyber Commons for Generation
Free Rider	The negative member not avoided	The positive member needed
Management	Sharing	Generation and Sharing



The contribution of free rider to community

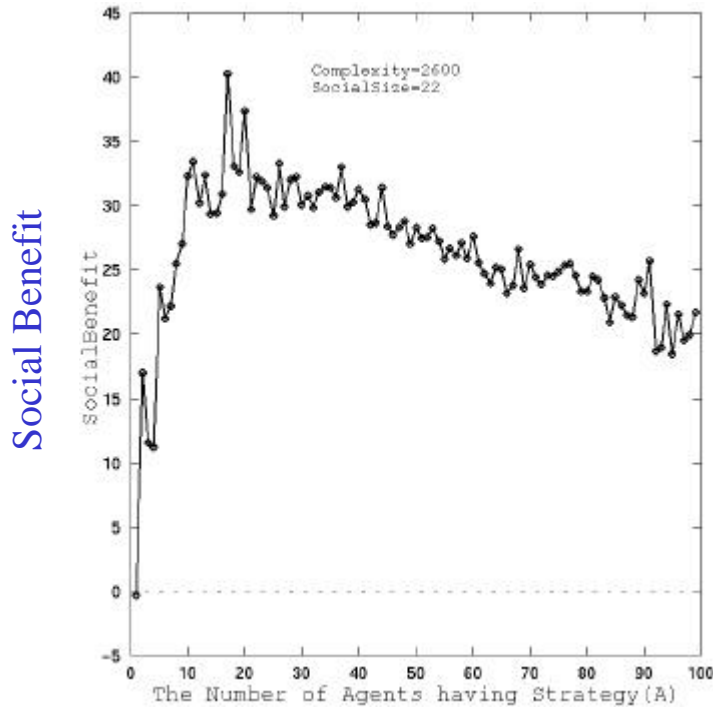
Formation of the trust by using information



Circulation of Reputation

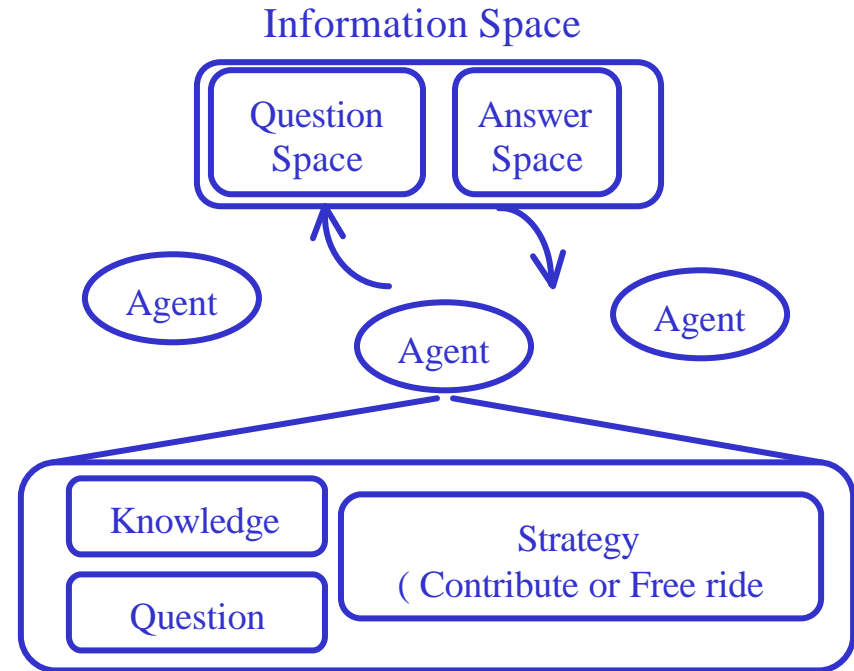
Role of Free Rider in Cyber Commons

Simulation of Cyber Commons which exchange Knowledge and Question among Agents (Yamamoto,Ohta,1999)



Rate of Contributive Agent

Increase of the social value by existence of a free rider



If all agents contribute, the amount of information will become superfluous.

Reputation in Knowledge Circulation

The power with which knowledge circulates is the same as that of the mechanism of a market
(Davenport, Prusak, 1997)

Reputation as a quality guarantee function
(Levine, Lippman, 1995)

Transactions activation by existence of reputation in the Internet auction
(McDonald, Slawson, 2000)

Importance of Reputation in the information circulation on Internet

The function which Reputation achieves on Cyber Commons

The example of market type Cyber Commons which Reputation functions

Reputation on Knowledge Marketplace

Role of Reputation in Cyber Commons

market of tangible goods	Community type Cyber Commons	Market type Cyber Commons
$P = h(V)$	$R = i(V)$	$P = f(R)$ $R = g(V)$
<i>Price is decided by Value of goods</i>	<i>Reputation is decided by Value of goods</i>	<i>Price is decided by the Reputation and Reputation is decided by Value of goods</i>

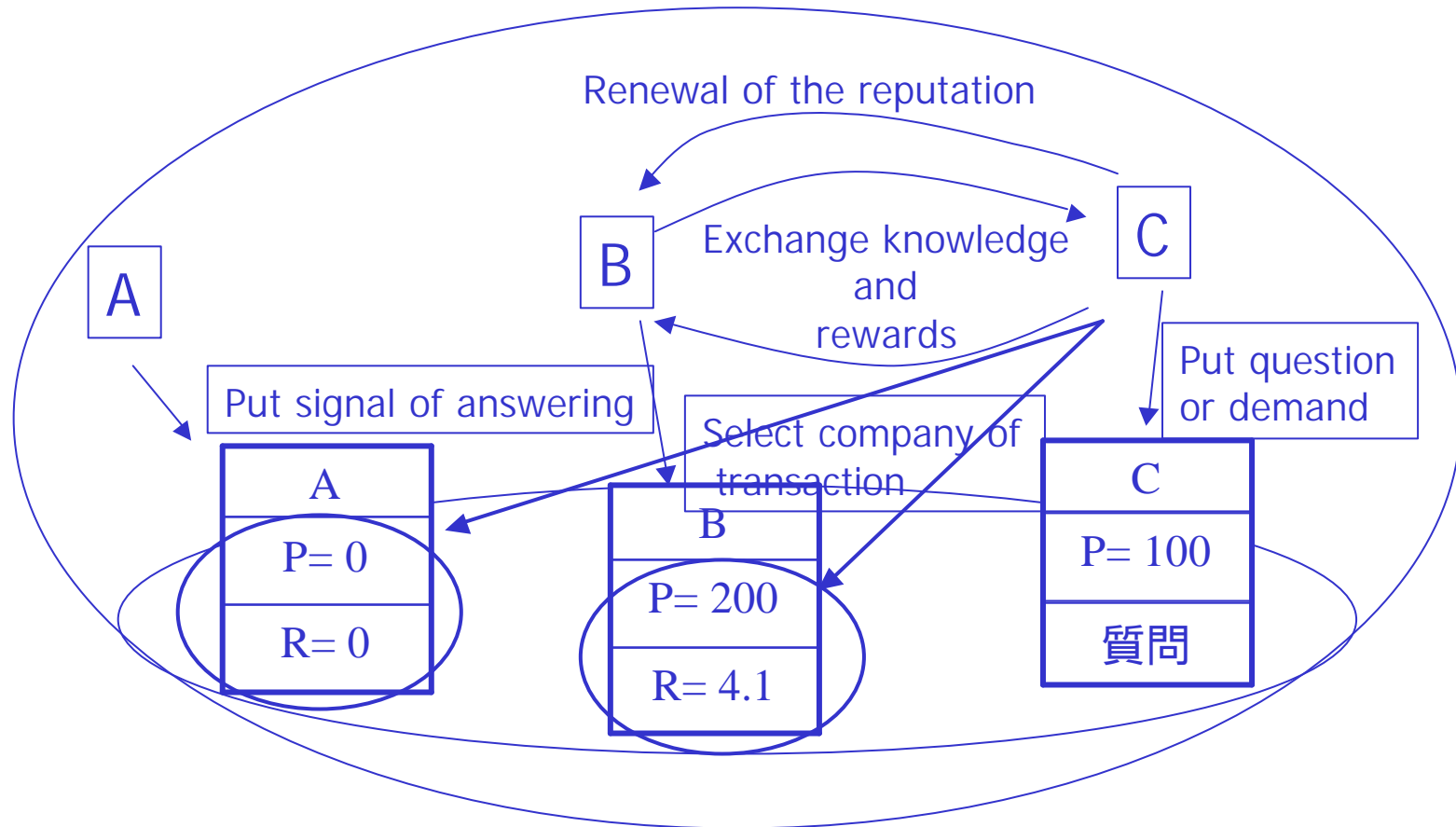
P : Price

V : Value

R : Reputation

Reputation on Knowledge Marketplace

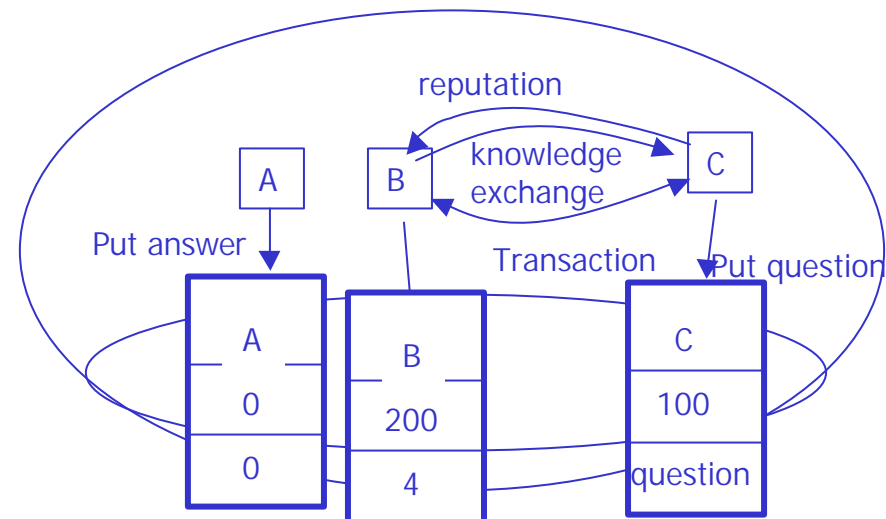
Information transactions flow of knowledge marketplace



Reputation on Knowledge Marketplace

The mechanism of reputation circulating

- One is able to trade at high price by one's reputation become high.
- By increasing the customer satisfaction, since reputation also increases, incentive which provides good knowledge works.
- The new entry knowledge supplier accumulates reputation from a consumer by stabilizing price low
- In this place, Reputation is exchanged among participants and circulates as alternative currency.



Example of Cyber Commons

Difference between market type cyber commons and community type cyber commons

	Information circulation	Information generation
Market type Cyber Commons	E-marketplace Knowledge Marketplace (K-square, Chienowa.com)	Customer Interaction Tanomi.com
Community type Cyber Commons	Napster,Gnutella	Linux

Summary

- Necessity of utilization human resources on a network
- Analysis of the property of Cyber Commons
 - Function :
 - Cyber Commons for Circulation
 - Cyber Commons for Generation
 - Rule :
 - Community type Cyber Commons,
 - Market type Cyber Commons
- Free rider in cyber commons may function effectively.
- Circulation of reputation operate cyber commons effectively.