

Social and Economic Incentives in Google Answers

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Abstract. What are the antecedents, inhibitors and catalysts to providing information and participating in mixed fee-based and free online contexts? This paper is a work in progress on the participation of about 500 “Researchers” in the Google Answers online service. We describe the behaviour of participants in this system over a 29 month period. Even though this is a fee-based environment, and answers are “worth” over \$20 (including tips) on average, labor economics of response to price and tip alone do not paint the full picture. Non-monetary incentives, such as “star” ratings from recipients and feedback in the form of comments account for some of the variance in participation. Descriptive and correlational findings are based on many thousands of answers. We thus corroborate some of the theories of hybrid explanation presented to date mostly in laboratory settings. The participation of experts in Google answers is associated with a hybrid of material (economic) and social motivators.

This is an initial report from a project about participation in the creation of content in open, internet systems. The broader context of this project includes data from both the formation of a Wiki-based textbook effort that involves several hundred co-authors, as well as the fee-based system studied here: Google Answers. In both systems the focus is on the efficacy of incentives to participation. In this early report we provide data only the latter system.

Google Answers is a fee-based information market where experts sell their expertise to askers for a price quoted by the askers (between \$2 - \$200 per question). Free sharing of information in the form of comments takes place alongside the information trades by other registered users. Google Answers encompasses “Researchers” (or “Experts”) who provide responses (or “Answers”) to questions that have an associated “Price”, tip, rating and may be followed by a discussion and comments. We undertook to examine this information market.

Using a specially developed Perl web agent we gathered all the questions, answers and other content on the site, parsed the text and inserted it into an SQL database for

further analysis. The web agent tool was designed to produce sequence URLs and fetch them rather than crawl the site. Using this method we were able to find unlinked pages too. We now have a large database of questions, described in the following.

This paper analyzes and reports on the relationships between participation, reward and feedback mechanisms on the GA system. Data on the commercial transactions as well as the communication process include, beyond prices and sales, information about feedback in the form of textual comments, “star” ratings on a 1-5 scale provided by recipients, gratuity (tips paid to the responders), and the like. Correlational analyses of these data shed light on some of the interesting theoretical and ideological questions surrounding the value of information.

In the following report, as well as on the site, “Answers” are defined as advice given in response to specific questions, and for a fee whereas comments constitute free advice. The rules of the site call for “buyers” to provide questions accompanied by a pre-declared “Price”. Buyers commit to paying this price (in addition to a small commission) if and when their question is answered. Three quarters of the declared price are awarded to the expert who provides the answer.

The community in question here is carefully and formally circumscribed. While any person who owns a valid credit card may post a question, only pre-approved “Experts” may provide a paid, sanctioned answer. Questions posted to Google Answers are publicly viewable on the Google Answers website so other registered users can add their insights and share the benefit of the research. Users who provide comments are not paid for their posts, but they may add interesting perspectives to the data gathered by the Researcher. The identity and personal information of participants is not revealed at any time; All participants are identified only by a self-selected Google Answers 'Nickname'. This fact, alone, makes for an interesting limit or flavour for the motivation to participate. Often questions don't have clear answers. Sometimes, the price posted for a question is too little to justify the time commitment required for an answer. It's also possible an answer is simply not available.

Our sample included all Google Answers' site activity (questions, answers, comments etc.) since its inception in April 2002 through December 7th, 2004. We removed all incomplete observations from the beginning and end of our sampling period and obtained a sample of 77,675 questions. To the best of our knowledge, this site has only been studied empirically once elsewhere, by Ben Edelman (2004)

GA element	Current Study	Edelman (2004)
Period of Study	06/2002 – 10/2004 (29 months)	04/2002 – 11/2003 (20 months)
Number of questions asked	77,675	43,262
Number of answers provided	37,971	24,290
Number of questions with comments only	21,828	NA
Number of questions with comments	39,436	NA
Number of comments sent	74,854	NA
Rated answers	23,869	NA
Tipped answers	7,504	NA
Number of experts	512	534
Average dollar value of question	\$19.37	NA
Average dollar value of answer	\$20.10	\$18.91

Average dollar value of unanswered question	\$18.66	NA
Average answer rating (on a 5 point scale)	4.60	4.33
Average answer tip value	\$8.86	\$8.77
System price range	\$2-200	
System tip range	\$1-100	

Table 1. Descriptive statistics in Edelman (2004) and in the present study

The theoretical question driving our investigation relates to the motivations of participants in online forums in general, and fee-based, public information markets such as Google Answers in particular.

In an earlier effort surrounding the same question, Edelman (2004) approached the question of incentives to participation as a labor economics problem. He found that experienced answers and researchers received higher ratings, that answerers adjust their behavior over time to better suit asker preferences, that the hourly pay for being active on the site did positively predict amount of effort invested (in other words, participation), that experienced answerers were more specialized. However, in his data a counter-intuitive finding of interest in the context of incentives to participation was that more specialized answerers earned less per-hour. Edelman explains that when a researcher insists on staying within a particular substantive field he/she forgoes opportunities in other fields. This behavior is cast as a lack of versatility and is therefore a negative characteristic on predicting earnings. Edelman also finds labor economics (pay per time perspective) in differential compensation for times of day and days of week responses. For example, the “graveyard shift” is less popular, less rewarded, and less desirable.

Our theoretical approach to this data set is to study the relations between economic, social and psychological incentives we have previously reviewed (Rafaeli and Raban, 2005; Rafaeli, Raban et al., 2005). As can be seen in Tables 2, we have correlational data corroborating the (not surprising) relation between remuneration and participation. Higher priced, and better tipped responders are more likely to participate.. We are interested in the value (incentive) added to participation by the social and communication arrangements. Ling et al. (2005) review social psychological incentives to participation. They follow in the footsteps of Rafaeli and Larose (1993), Constant et al. (1994) and Kollock and Smith (1996) in expressing the group and communication based inputs that can be fed-back by the system in order to increase contribution, fidelity, commitment and sense of belonging. Following Ahituv (1989) and Rafaeli and Raban (2003) we search for a richer description and a quantitative measure of the confluence of the economic and behavioral to participation and the valuation of information.

The issue of demand for information or the willingness to pay for it has been addressed by behavioral as well as economic research. In economic terms information can be either a public or a private good. As a public good, few people pay for information but everyone enjoys it (Tragedy of the Commons). Exchanges in online forums are often cited as public goods. Private information goods require direct payment by each user. Information markets are unique in that the public and private information goods may co-exist adjacently and are therefore likely to affect each

other's consumption patterns. The present research aims to investigate this relationship.

Information is expensive to produce and cheap to reproduce (Bates, 1989; Shapiro and Varian, 1999). The cost of information can be either direct or indirect. The quest for the right pricing for information and participation is further complicated by the fact that information is an experience good, meaning that its value is revealed only after consumption (Shapiro and Varian, 1999; Van Alstyne, 1999).

Behavioral research revealed that the value of information is derived from perceptions of at least three central elements: cost, quality, and ownership (Toften and Olsen, 2004; Raban and Rafaeli, 2005). Manipulation of one or more of these elements can have dramatic effects on information trading and sharing markets. And where manipulation is possible, social and cultural concerns come into play.

The mean question price asked for was about 19.37 dollars. Neat, “round” figures were most popular, with over 12,000 of the questions priced at \$5, over 13,000 priced at \$10, and so forth. The standard deviation of question price was over \$30. The mean tip (gratuity) was \$8.86. Tips amounted to 4.42% of the income generated by selling answers. For a face-to-face environment such as a restaurant or hotel lobby this rate of gratuity may sound modest. However, this level of tipping may be considered high in a voluntary, anonymous online system with no prior traditions or set norms and with no accumulated reason to provide tips (seller and buyer have little acquaintance, less expected future relationship, and no identification). Recall that (according to one urban myth) “tip” stands for “To Insure Promptness”. Promptness is one thing this system has even without tips.

People tend to transfer the traditional economic behavior with which they are familiar from the real world and apply it in online contexts although greater freedoms are afforded online. We have found this previously in relation to the subjective value of information in trading and sharing contexts (Rafaeli and Raban, 2003; Raban and Rafaeli, 2005).

Over time, the system displays stability, though some trends can be discerned. Figures 1, 2, and 3 show participation and the performance of price, tips and responses over time.

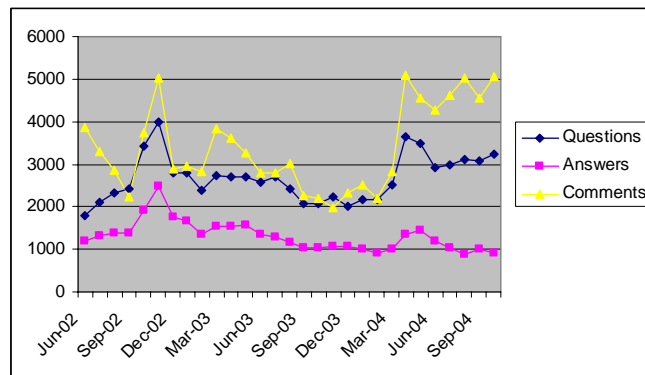


Figure 1. Frequency of questions, answers and comments

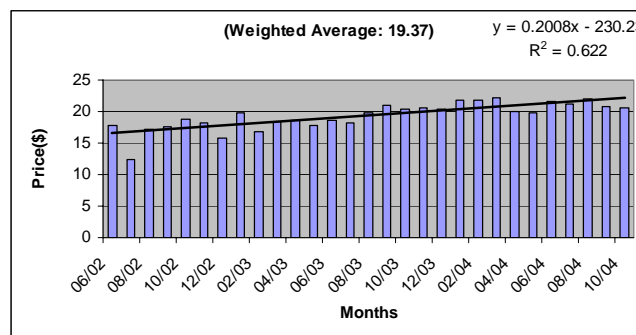


Figure 2. Mean monthly prices of questions

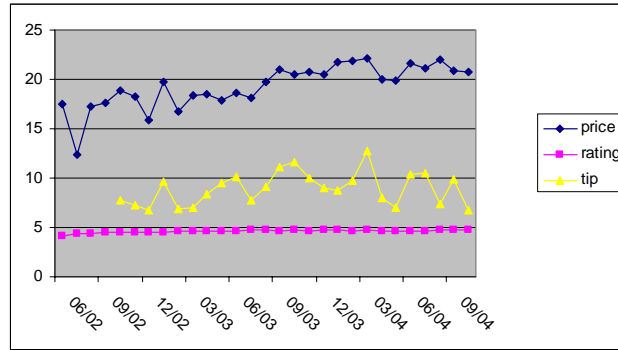


Figure 3. ratings over

Price, tips and time

Full set of answers (37,971)	Price	Tip	Rating	Comments
Kendall's tau	.304(**)	.096(*)	-.018	-
Significance (2-tailed)	.000	.015	.609	-
N (responding experts)	509	290	460	-
Answers with comments (17,609)				
Kendall's tau	.313(**)	.259(**)	.106(**)	.081(*)
Significance (2-tailed)	.000	.000	.006	.027
N (responding experts)	475	261	436	475

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 2. Correlations, per responding expert, of number of answers provided with the price of the answer, the tip (gratuity) and the rating (in stars).

Table 2 indicates a correlation between economic incentive (price) and amount of questions answered. Tips are only very weakly correlated, and the socially constructed ratings are not correlated at all. However, after the dataset is pruned to contain only those question and answer pairs (and attendant “discussions”) in which at least one comment was provided, the correlations of socially-based incentives with participation rise, and become significant.

Of the 77,675 questions in our dataset, about one half were answered. Of those, just under half (for a total of 17,609 or one quarter of the entire database) generated conversation (interactivity) beyond a single shot reaction. The upshot of these preliminary findings are that, when interaction is present (answers with comments, Table 2), the social parameters of rating and comments contribute incentives to the formation of participation, beyond the role of economic incentives.

References

- Ahituv, N. (1989). Assessing the value of information: Problems and approaches. Paper presented at Proceedings of the Tenth International Conference on Information Systems, Boston, MA.
- Bates, B. J. (1989). Information as an economic good: A reevaluation of theoretical approaches. in B. D. Ruben and L. A. Lievrouw. Mediation, Information, and Communication. (379-394). New Brunswick, NJ: Transaction Publishers.
- Constant, D., S. Kiesler and L. Sproull (1994). What's mine is ours, or is it? A study of attitudes about information sharing. Information Systems Research 5(4), 400-421.
- Edelman, B. (2004). Earnings and Ratings at Google Answers. <http://cyber.law.harvard.edu/people/edelman/pubs/GoogleAnswers-011404.pdf>. Accessed in 2005.
- Kollock, P. and M. Smith (1996). Managing the Virtual Commons: Cooperation and Conflict in Computer Communities. in S. Herring. Computer-Mediated Communication: Linguistic, Social, and Cross-Cultural Perspectives. Amsterdam: John Benjamins.
- Ling, K., Beenen, G., Ludford, P., Wang, X., Chang, K., Li, X., Cosley, D., Frankowski, D., Terveen, L., Rashid, A. M., Resnick, P., and Kraut, R. (2005). Using social psychology to motivate contributions to online communities. Journal of Computer-Mediated Communication, 10(4), article 10. <http://jcmc.indiana.edu/vol10/issue4/ling.html>
- Raban, D. R. and S. Rafaeli (2005). The effect of source nature and status on the subjective value of information. Journal of the American Society for Information Science and Technology in press.
- Rafaeli, S. and R. J. LaRose (1993). Electronic bulletin boards and "public goods" explanations of collaborative mass media. Communication Research 20(2), 277-297.
- Rafaeli, S. and D. R. Raban (2003). Experimental investigation of the subjective value of information in trading. Journal of the Association for Information Systems 4(5), 119-139.
- Rafaeli, S. and D. R. Raban (2005). Information sharing online: a research challenge. International Journal of Knowledge and Learning 1(1/2), 62-79.
- Rafaeli, S., D. R. Raban and Y. Kalman (2005). Social Cognition Online. in Y. Amichai-Hamburger. The social net: The social psychology of the internet. Oxford, England: Oxford University Press.
- Shapiro, C. and H. R. Varian (1999). Information Rules: A Strategic Guide to the Network Economy. Boston, MA: Harvard Business School Press.
- Toften, K. and S. O. Olsen (2004). The relationships among quality, cost, value and use of export market information: An empirical study. Journal of International Marketing 12(2), 104-131.
- Van Alstyne, M. W. (1999). A proposal for valuing information and instrumental goods. International Conference on Information Systems. Charlotte, NC.

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