A Study of Internet User Attitudes Toward Focused Broadcasting on the World Wide Web

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Abstract. Amidst the debate on the relative merits of push versus pull technologies, the role of information dynamics over the Internet in shaping truly compelling use of the medium for electronic commerce is being recognized. Focused Broadcasting, a business model of matching classified and want ads using the World Wide Web, is positioned as an example of a balanced approach whose success may be predictable based on market research and analysis. This article reports on a study conducted in New Zealand of Internet user attitudes toward this type of service.

Key words: electronic commerce, information dynames, marketing on the Internet, advertising on the World Wide Web.

Introduction

Through its explosive growth in recent years, the Internet has long been regarded as the antithesis of conventional broadcasting media such as newspaper, radio, and television. Instead of pushing generic content designed for mass consumption to the user, it lets the latter control the process of communication by pulling in only items of personal interest. The liberating effects of this approach appeared to culminate with the proliferation of the World Wide Web as the increasingly popular medium to publish and browse information. Speculations on the potential for business applications in electronic commerce have led to grossly exaggerated evaluation of Internet-related business start-ups resulting in the so-called "dot.com craze". Indeed, as enterprises large and small scurried to stake their presence on the Web, hopes were high that once that is done, the whole world will come knocking. To date, this has rarely been the case (Essick, 1997). In the haste of jumping on the band wagon, many commercial Web projects suffered from murky definition of business purposes and dubious value-added for the customers. See (Ho, 1997) for a global study of commercial web sites using a purpose-value framework from the perspective of consumers. In any case, with millions of sites vying for attention, advertisers were losing patience with the "pull" format. In came "push" technology to the rescue by delivering more or less customized content to a browser's desktop along with unsolicited advertising (Business Week Special Report, 1997; Kelly and Wolf, 1997). To the critical observer (Caruso, 1997; Levy, 1997), this approach is tantamount to retrofitting the Internet with

cable television. While convergence of the two media may indeed facilitate penetration of the mainstream market, real progress is unlikely with the simple blending of one into the other. It now appears that such progress may not be totally reliant on the invention of more techno-gizmos. Rather, it can depend more on the creation of value (GVU's WWW User Surveys, Graphics, Visualization and Usability Laboratory, Georgia Institute of Technology) through truly compelling uses which take full advantage of the defining features of the Internet with a suitable balance of push and pull.

In (Ho, 1999), one example of a compelling application of the Internet known as focused broadcasting was introduced. It is essentially a matching service for classified and want ads. For completeness, we first recapitulate the mechanics of this model and where it fits in the push-pull framework of information dynamics presented in (Ho, 1999). Then a study of Internet user attitudes toward such service is reported. The study, conducted in June 1997, involved five groups of Internet users in three cities in New Zealand, a country that mirrors the rapid development and deployment of the Internet infrastructure worldwide. Conjoint analysis was used to identify user attitudes toward three attributes in the model as well as cluster groups of various user types. It was found that across all cluster groups, there is consensus on the appeal of the approach. Attribute partworths and importance weights obtained from the analysis can be used to evaluate specific design options in actual planning and implementation of focused broadcasting on the World Wide Web.

Focused Broadcasting

Much as the Internet is undergoing explosive growth, penetration of the mass market is still far from reality (Coates, 1997). It is quite conceivable that significant breakthrough may not depend solely on further advances in the technology, but rather on truly compelling applications of what is already available. Take senior citizens for example. Most of them have no interest in high technology in its own sake. Judging from demographic data (see, e.g., GVU's WWW User Surveys, Graphics, Visualization and Usability Laboratory, Georgia Institute of Technology) efforts to pitch computers to them as gadgets of pastime or tools to keep an active mind have only very limited success to date. However, grandparents are likely to find "videoconference" over the Internet with their out-of-town grandchildren compelling (Meyerhoff, 1996). Others may be similarly impressed by healthcare resources, or electronic service delivery by government on the Web. In our context, any feature that is attractive enough to lure people into gaining access to the Internet is considered truly compelling.

In (Ho, 1999), the model of Focasting was introduced. It stands for "focused broad-casting", an advertising system that takes full advantage of both the culture and the technology of the Internet in general, and the World Wide Web in particular. Three parties are involved: Viewer, Focaster, Advertiser. The Viewer registers with the Focaster (who may be an ISP, E-Mall, Directory, Web-Host, etc.) free of charge, indicating specific items, categories, or sources of interest. Provided with an ID and Password for subsequent visits, the Viewer sees Web pages at the Focaster's site showing only timely information

furnished by Advertisers of interest. The Advertiser pays the Focaster at rates that can be meaningfully established and negotiated based on Viewer demands.

Focasting is essentially an automated matching service for classified and want ads over the Internet. However, it is not information brokering, purchase agency, or any traditional role of go-betweens and middlemen. As the trend in cyber-culture is toward disintermediation, even automation of such models is not promising. Instead, the Focaster strives to be an efficient conduit of valuable information. Apart from helping to classify and match the supply and demand, no value judgment is exercised. Hence, no value-based commission is charged. The Viewer sees only what is of interest, for free. The Advertiser reaches only those who are interested (a focused audience), and more cost-effectively than with conventional advertising. The Focaster earns a fee by providing the service, leveraging Web technology for economies of scale. Why not charge the Viewer a fee? Obviously, the Viewer derives value from the service and may indeed be willing to pay for it. However, competition among Focasters will eventually drive this fee to zero. As long as Focasting generates sales for the Advertisers, they have an incentive to pay.

There are many precursors to the building blocks of the Focasting system. Customized reports and newspapers embody the same technology, but not the economics. Existing E-Malls and Industry Networks serve the same purpose, but lack the dynamics to balance the pushing and pulling of information. Ultimately, it is the recognition that by catering fully to the Viewer, the Focaster ends up with a product that is perfectly marketable to the Advertiser. With the new focused channels, the Advertiser can concentrate on timely and customized announcements, rather than the relatively static and mass appeal approach in conventional media.

The relative positioning of Focasting in the schema of information dynamics (Ho, 1999) is illustrated in Fig. 1. Note that it can be regarded as a balanced act of pull and push since contents of interest are linked in real time and pushed to the Viewer. However, the latter takes the initiative and control of the timing of communication. The only basic technical requirement to implement Focasting is the ability to generate data-based Web pages on the fly, which is already widely available with most server systems. There is no drawback in terms of high bandwidth demands as with existing push technology.

With obvious applications in real estate, collectibles, automobile, travel and leisure, trade and commerce, features on commercial Web sites that fit the Focasting model are

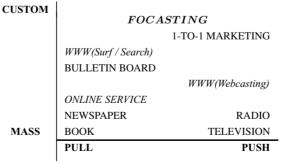


Fig. 1. Information dynamics of focasting.

indeed proliferating. Prime examples include the Personal Retriever offered by Coldwell Bankers (www.coldwellbanker.com) for the real estate market. Here, the viewers may set up a profile specifying the type and size of houses, the neighborhood or township, and the price range of interest to create customized real estate listings. Similarly, Global Sources Online (www.globalsources.com), a provider of trade information for volume buyers of products from suppliers worldwide features its Product Alert service. The viewer chooses to monitor product categories from extensive lists of options, in order to be on constant look out for timely offerings from wholesalers and manufacturers. An example using e-mail notices without customized Web pages is the Career-Builder (www.careerbuilder.com), a job search/recruiting network. Here, using its Personal Search Agent, the registered Viewer may maintain up to five profiles, each indicating a choice of job type and geographical location. Subsequently, e-mail notification of new job postings by Advertisers that fit the Viewer's profiles are sent daily.

A Study of User Attitudes

To explore the potential of Focasting as a compelling application that may play a role in fostering electronic commerce, a study of Internet user attitudes toward the model was conducted. The opportunity arose during the authors's visit to New Zealand in May and June 1997 as a Visiting Erskine Fellow at the University of Canterbury at Christchurch. We begin by explaining why this backdrop is particularly suitable for a pilot study that can produce results indicative of user attitudes worldwide.

Environment

With a population of 3.6 million, New Zealand is among the top countries in the development and deployment of the Internet infrastructure. According to statistics compiled by the Ministry of Commerce (Templeton, 1997) in 1997, one out of four households has a home computer. The number of Internet host computers increased from 1,193 in July 1991 to 84,532 in January 1997, a growth of 700% compared to that of 300% worldwide. In terms of the number of Internet hosts per 1000 people, New Zealand ranks seventh in the world with 23. The top ten countries are led by Finland with 56. The US is fourth with 38; Canada is ninth with 20. As of March 1997, there were 9,620 registered Internet domains in New Zealand, 8,343 of which being commercial. In 1996, the mean student to computer ratio in the 2,736 primarily and secondary schools was 18. About a third of the schools were connected to the Internet, with most of the rest intending to do so by January 1998. A directory of ISP's had 64 listed as of June 1997.

Given these parameters, and the fact that it would be difficult in any case to arrive at truly representative results of a global nature, we believe the results will be useful as a significant pilot study.

Attributes of Focasting

Gordon and De Limer-Turner (Gordon and De Lima-Turner, 1997) studied consumer attitudes toward Internet advertising in general. They pointed out that unlike other forms of advertising, the social contracts governing Web advertising is evolving and not well understood by all parties affected (consumers, advertisers, media, and agencies.) Primarily concerned with how unsolicited advertising is pushed to the consumers, they identified several attributes as the subjects of study: access, placement, message, influence on fee, and information collection. For Focasting, the business model is better defined as a balance of soliciting information (pull) and advertising (push) so that most of the above attributes are no longer relevant. Still, using the same perspective of social contract, the following attributes of Focasting are found to be important in its implementation. While further refinements are certainly possible, we consider only two levels for each of the three attributes in this study.

i) Communication

This attribute reflects the push-pull balance. Level zero is our base model, without any intervention on the part of the Focaster. The Viewer logs on the Focaster's site to view latest information at will and without prompting. Level one involves notification by e-mail whenever there is new information of interest. While this feature, which elevates the degree of push in the model, may appear to enhance the timeliness of communication, in practice it can multiply the volume of e-mail and eventually become a nuisance.

ii) Latitude

This attribute controls the strictness in adherence to customization. At level zero, the Viewer sees only ads that match exact criteria stored in the requested profiles. For example, if one is looking for a used car of a specific make, age, condition, and price range, then only ads for such cars will be shown. At level one, the Focaster accepts additional sponsorship to increase revenue. For instance, an ad for an auto paint shop may be included for any Viewer looking for a used car. Unlike totally unsolicited ads, such related ones may be acceptable to many users. With such sponsorship, the Focaster can offer more affordable rates to the focused Advertisers and hence improve on the service to the Viewers.

iii) Privacy

In the specification of an interest profile (the want ad), the Viewer can be offered a selection of options that are totally impersonal. For example, in a job search profile, only the type of job, location, etc. may be used. The matching is then performed to gather what the Viewer is looking for. This is level zero where no other personal data need be divulged. At level one, additional demographic data (gender, age, qualification, experience, etc.) are involved. This may help generate better matches of potential interest.

Sample

The selection of participants is a cross between convenience sampling and focus groups. The entire sample comprised five separate groups. The first included 35 students in a

third-year course in telecommunication systems. The second had 4 students in a graduate research seminar. The third group was from a large class in a first-year introductory course in information systems and technology, in which 110 students participated in the survey. These three groups were from the University of Canterbury at Christchurch. The fourth group had 27 graduate students, mostly practicing professionals, in a diploma program in information management at the Victoria University of Wellington. The fifth group involved 14 participants, also mostly practicing professionals, in an executive seminar at Auckland University. The total number of participants was 190.

Being affiliated with universities and students in information technology related courses, all the participants are users of the Internet. The author's access to the groups as guest lecturer made them convenient samples. An average of approximately 40 minutes was spent in surveying each group. A brief introduction of the push-pull dynamics, the Focasting model, and a demo of the Monster Board case were presented and discussed as in focus groups. Finally, a written survey was completed asking for the likelihood of the participant using Focasting under various scenarios.

All five surveys were conducted between June 16 and June 27, 1997. Although our sampling was unconventional, the resulting demographics suggest that it can very well be representative of the regional population of Internet users at large.

Instrument

With three attributes at two possible levels each, there is a total of eight full profile scenarios. Since this should be a manageable number of tasks for the participants, all were asked to rate the likelihood of their using each scenarios. A 7-point scale was used, with (7) indicating "definitely", (6) "very likely", (5) "somewhat likely", (4) "undecided", (3) "somewhat unlikely", (2) "very unlikely", and (1) "definitely not".

Demographic, PC ownership, Web usage, and questions on experience with buying and selling through classified and want ads were also asked. Ten to fifteen minutes were allocated to completing the survey.

Analysis

The approach of conjoint analysis (Myers and Tauber, 1977) was used to identify user attitudes toward the three attributes in the model as well as cluster groups of various user types (McDonald, 1996). First, each participant's responses to the full profile scenarios were fitted in a linear regression using dummy variables. Levels zero and one of each attribute were represented by an independent variable at value of 0 and 1, respectively. The dependent variable was the likelihood rating. The coefficients of the regression were interpreted as estimates of the partworths for the corresponding attribute level.

Since the setup for the study is far less elaborate than that for the typical focus group, it is necessary to screen for usability of the responses. Given the limited time frame, some participants may not have understood one or more of the elements: the Focasting model, the scenarios, or the survey task itself. As a convenience sample, some participants may

not have genuine interest in taking the task seriously or forming a thoughtful opinion. Assuming that such cases were likely to lead to inconsistent responses, we used the R-sq as a measure and rejected cases with a value under 0.5 for the analysis. Of the 190 responses, 147 were retained with a mean R-sq of 0.8.

Next, to identify cluster groups of user attitudes, standardized partworths obtained from the regression coefficients for individuals were analyzed using Ward's method as implemented in SPSS for Windows (Release 6.1). Preliminary examination of the results for 2, 3, 4, and 5 clusters suggested that the 3-cluster partition had the most meaningful interpretation. As the hierarchical approach in Ward's method did not allow reclassification of cases, the 3-cluster partition was refined with discriminant analysis. Stable clusters were obtained after reclassifying seven cases in the first iteration and two cases in the second.

To compute attribute importance weights for each individual case, the difference between the regression coefficients of the two levels for each attribute was divided by the sum of such differences for all three attributes. Note that there were a number of cases with zero regression coefficients for all attribute levels. These had to be interpreted as having "equal" importance weights for each of the three attributes for the consistency of subsequent analysis. Demographic characteristics of the three cluster groups were compared using anova for continuous variables and chi-square tests for categorical variables. Mean partworths and importance weights were tabulated for the cluster groups as well as the entire sample. Anova was used to test for significance.

The highest rating among all eight scenarios by each individual is considered the likelihood of that individual using a Focasting service. The distribution of these likelihoods were compiled as an indicator of how compelling Focasting is as an application of the Internet. Chi-square tests were used for variation among groups.

Results

From the original 190 cases, the sample was reduced to 147 (henceforth referred to as the whole sample) after eliminating those judged to be unreliably inconsistent. Clustering and refining with discriminant analysis, three groups that were later labeled Realists, Purists, and Optimists were obtained, with membership of 36, 66, and 45, respectively. Their characteristics were summarized in Fig. 2.

The percentages for certain entries did not add up to 100 owing to blank responses and rounding. For the whole sample, the gender mix was about two to one for male and female. Half of the participants were between 20 and 35 years of age. The majority owned PC's but less than half had their own modems. About two thirds had never bought anything through classified and want ads. Even more had never sold that way. However, for those who had done so, repeated uses outnumbered unique experiences. Seven in ten were regular (often or daily) Web users.

To identify variation across the cluster groups, Chi-square tests were performed on the group characteristics at the $\alpha=0.05$ level of significance. It is found that age distribution is marginally independent of grouping (p=0.057). Gender mix is independent

Characteristics of Groups		SAMPLE	REALISTS	PURISTS	OPTIMISTS
		(N = 147)	(N = 36)	(N = 66)	(N = 45)
GENDER					
	Male	66%	75%	62%	64%
	Female	30%	17%	36%	31%
AGE					
	Under 20	31%	28%	26%	42%
	20-25	26%	31%	20%	31%
	26-35	24%	19%	30%	18%
	Over 35	16%	19%	23%	4%
OWNERSHIP					
	PC	64%	69%	68%	53%
	Modem	46%	53%	42%	44%
BUYING through	Classified Ads/BI	В			
	Never	65%	61%	64%	71%
	Once	10%	17%	12%	2%
	More than once	23%	22%	23%	24%
SELLING through	Classified Ads/B	В			
	Never	71%	67%	68%	80%
	Once	12%	11%	12%	13%
	More than once	16%	22%	20%	4%
USE of WWW					
	Never	7%	5%	3%	13%
	Rarely	23%	14%	35%	13%
	Often	48%	64%	44%	42%
	Daily	22%	17%	18%	31%

Fig. 2. Profile of cluster groups.

of grouping (p=0.16). Web usage varies across groups (p=0.01). Ownership of PC's (p=0.73), buying (p=0.30) and selling (p=.19) experience with classified/wants ads are all independent of grouping.

The mean partworths of the attribute levels and the mean importance weights for the attributes by cluster groups are tabulated in Fig. 3 and 4, respectively.

We now explain how the mean partworths of the cluster groups led to their nomenclature. The first group of 36 are, on the average, strongly negative (-0.7) about e-mail notification, marginally negative (-0.06) about related but unsolicited ads, and marginally positive (0.05) about supplying demographic data. We refer to this group as Realists as they appreciate how easily one can get overloaded with e-mail, that advertising sponsorship is perhaps an unavoidable economic reality, and that effective customization requires personal data. As Web usage is the only characteristic that varies significantly across the cluster groups, we observe that the Realists are the more frequent and hence more experienced users of the Web. The second group of 66 are quite negative (-0.18) about e-mail

	SAMPLE	REALISTS	PURISTS	OPTIMISTS
Attribute	(N = 147)	(N = 36)	(N = 66)	(N = 45)
Level				
Communication				
E-Mail Notices	-0.21	-0.7	-0.18	0.15
None	0	0	0	0
Latitude				
Related Ads	-0.22	-0.06	-0.55	0.13
Exact Match	0	0	0	0
Privacy				
Demographics	0.02	0.05	-0.09	0.16
No Personal Data	0	0	0	0

Fig. 3. Mean partworths.

	SAMPLE	REALISTS	PURISTS	OPTIMISTS
Attribute	(N = 147)	(N = 36)	(N = 66)	(N = 45)
Communication	0.38	0.70	0.26	0.28
Latitude	0.36	0.13	0.55	0.28
Privacy	0.26	0.17	0.19	0.44

Fig. 4. Mean importance weights.

notification, very negative (-0.55) about related but unsolicited ads, and marginally negative about supplying demographic data. They are called Purists as they seem to be resisting the commercialization of the Internet. This is consistent with the fact that they have the highest percentage of occasional users. The third group of 45 are quite positive about all three factors (0.15, 0.13, 0.16, respectively.) We call them Optimists as they appear to embrace value-added without being concerned with the tradeoffs. If we do consider a slight variation in the age distributions among groups, the Optimists tend to be younger, with 73% under 26 compared to 57% for the whole sample.

Anova returned significant differences for all entries among groups except the following. Mean partworths for Privacy were not significantly different between Realists and Optimists. Mean importance weights for Privacy were not significantly different between Realists and Purists. Mean importance weights for Communication were not significantly different between Purists and Optimists.

For an indicator of how compelling Focasting is as an application of the Internet, the highest rating among all eight scenarios by each individual was used. This is the likelihood of that individual using some version of Focasting. The distributions of these likelihoods for the cluster groups are tabulated in Fig. 5.

For the whole sample, 93% are at least somewhat likely to use Focasting; with 76%

	SAMPLE	REALISTS	PURISTS	OPTIMISTS
Attribute	(N = 147)	(N = 36)	(N = 66)	(N = 45)
Likelihood of using Focasting				
Definitely	33%	31%	36%	31%
Very Likely	43%	44%	46%	36%
Somewhat likely	17%	19%	16%	6%
Undecided	6%	3%	2%	16%
Somewhat unlikely	0%	0%	0%	0%
Very unlikely	0.7%	3%	0%	0%
Definitely not	0.7%	0%	0%	1%

Fig. 5. Likelihood of using focasting.

very likely or definitely. From a Chi-square test, the likelihood distributions are dependent on the groups (p=0.03). This is due to the relatively high number of "undecided" among the Optimists. Setting aside this category of response, the likelihoods are not significantly different among the cluster groups (p=0.9).

Discussion

The pilot study of Internet user attitudes produced strong evidence that Focasting, a model for matching up classified and want ads on the World Wide Web, can be a compelling application. Nearly all (93%) in our sample indicated likelihood to use it in some form. As to variations in user attitudes, three cluster groups were identified and interpreted as Realists, Purists, and Optimists. One important finding is that all three groups are of significant proportions, comprising 24%, 45%, and 31% of the whole sample, respectively.

Since both Realists and Purists do not care for e-mail notification, this feature, even as an option, can be assigned relatively low priority. The Purists, being dominant in number and less frequent users, represent the major challenge in penetration of the mass market. Their distaste for unsolicited advertising will have an impact on the economics of Focasting. Indeed, one way to cater to this group is to provide an option in their profile to switch sponsoring ads off. However, the reduction of exposure implies lower revenues from sponsors (Zinkhan and Watson, 1996).

Another somewhat surprising finding is that across all groups, users are not as negative about providing input data to enhance matching as commonly perceived (Breanahan, 1997). This is perhaps due to the understanding that useful data can be elicited for Focasting without becoming intrusive. For example, in a job search profile, area of expertise, previous positions, salary history, etc. can all be useful without actual names, addresses, or any data for positive identification. Again, the best strategy here seems to be offering as many options to the user as possible.

As limitations of our pilot study, we emphasize both the regional and convenient nature of our sample. Based on crude consensus analysis of myriad surveys and demographic studies (see, e.g., www.e-land.com), a globally representative sample would probably have a higher mix of older users as well as women.

Finally, with the encouraging results from this pilot study, future research on more specific implementation of Focasting, such as for real estate, collectibles, automobile, travel and leisure, supply chain management, and international trade can be expanded along the lines of additional attributes and levels. This work provides the foundation for exploring a model that has the potential of a compelling application to foster electronic commerce over the Internet.

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Interneto vartotojų požiūrio į fokusuotą informavimą WWW tinkle tyrimas

James K. HO

Debatuose apie spaudimo metodų privalumus, lyginant juos su viliojimo metodais, kristalizuojasi nuomonė apie esminę Interneto rolę elektroninėje komercijoje. Fokusuotas informavimas – tai biznio modelis, suderinantis abu minėtus WWW tinklo panaudojimo metodus. Fokusuoto informavimo rezultatus galima prognozuoti naudojant rinkos tyrimo ir analizės metodus. Straipsnis aprašo tyrimus, atliktus Naujojoje Zelandijoje, tikslu nustatyti Interneto vartotojų požiūrį į šio tipo aptarnavimą.