The Role of Consumer Innovativeness in the Adoption of Internet Shopping in Singapore

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ABSTRACT

The objective of this paper is to examine why current users of the Internet might want to shop on the Web. In particular, we investigate the role of consumer innovativeness in the determination of online shopping. Our survey of 154 respondents in Singapore reveals that individuals with higher levels of Internet usage and those who score high on (a) open-processing innovativeness and (b) domain-specific innovativeness are more likely to adopt the Internet for shopping. Domain-specific innovativeness was found to have the biggest impact (b=0.61), followed by Internet usage (b=0.17) and open-processing innovativeness (b=0.06). Since both open-processing innovativeness and domain-specific innovativeness have positive effects on consumer adoption of online shopping, marketers of products on the Internet may want to develop the means by which they can nurture both general innovativeness and Internet-related innovativeness among consumers.
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INTRODUCTION

No technology has engendered a level of interest as unprecedented in the history of business as the Internet (Peterson, 1997). Indeed, the Internet seems to be the answer for impediments that plague the old business model: slow transmission lines, insecure electronic payments, and the lack of affordable full-motion demonstrations of the merchandise (Jarvenpaa and Todd, 1997). Travel time and cost are virtually eliminated for consumers, while opportunities such as charging on-line transactions and direct marketing of existing products or services present themselves to businesses. It was estimated that in 2001, there were more than 165 million World Wide Web users in the US alone (www.Nielsen-Netratings.com 2001). As such, the Internet looks set to revolutionize our lives (Sheth and Sisodia, 1997).

Future commercial success of the Internet in the retail scene, however, remains to be seen. To the extent that consumers are willing to adopt this new medium for product purchase, the Internet will be a useful channel for business to reach out to consumers far and wide. The consumers’ role in the acceptance of the Internet as a retail channel therefore demands further investigation. As Singapore mores towards a knowledge-based economy and more and more of its people are Internet savvy, it is likely that over time, many of the current users of the Internet will adopt (or at least try out) this medium for online purchasing. Indeed, the government's push towards e-government has resulted in a general acceptance of the efficiency and effectiveness of having on-line communications and transactions.

Much of the research on Internet marketing has focused on estimating customer base, developing customer profiles, or determining what people are buying and how much they are spending. Reasons why consumers might shop on the Web have received relatively little attention (Sim and Koi, 2002). The present
research hopes to shed more light on why some consumers who are Internet users are more likely to use this new medium for shopping than other users. In addition, following Citrin, Sprott, Silverman and Stem (2000), we will ascertain the moderating role of innovativeness in determining the relationship between general Internet usage and Internet shopping.

LITERATURE REVIEW

Internet usage

In general, heavy users within the product category or those with significant experience in similar product categories are more likely to innovate and adopt related new products. This is because heavy users have acquired the ability and knowledge structure to predict outcomes for closely related products. Hence, it is likely that prior knowledge of the product class may lead to an increased ability to detect superior new products in that class and contribute to probability of adoption. In the context of Internet marketing, this would mean that consumers who are highly familiar with the usage of the Internet for purposes other than shopping (such as for communication, education, or entertainment) are more likely to adopt the Internet for shopping. Following Citrin et. al. (2000), we will test the hypothesis below:

\[ H1: \] Higher levels of prior Internet usage (for purposes other than shopping) will result in increased levels of the use of the Internet for shopping.

Consumer innovativeness

Innovativeness has been a well-researched topic in both the organisational (e.g. Hurley and Hult, 1998) and the consumer (e.g. Goldsmith and Flynn, 1992; Blythe, 1999; Goldsmith, d’Hauteville and Flynn, 1998) literature. Innovativeness is a personality construct that is possessed, to a greater or lesser degree, by all individuals since everyone at some point in his/her life will adopt new objects or ideas. Midgley and Dowling
(1978) considered innate innovativeness as “the degree to which an individual is receptive to new ideas and makes innovation decisions independently of the communicated experience of others”. In the context of business and marketing, consumers’ innovativeness is closely related to the adoption of the product (Blythe, 1999; Rogers 2003) and this influences the speed with which the adoption takes place after a product enters the market (Goldsmith and Flynn, 1992). Thus consumer innovativeness has a great impact on the success of Internet shopping. In the literature, two main types of consumer innovativeness, open-processing innovativeness and domain-specific innovativeness, have been used to define and measure the construct (see, for example, Joseph and Vyas, 1984; Goldsmith, 2001).

**Open-processing innovativeness**

Open-processing innovativeness influences the ways in which a person reacts to new products and their corresponding sensations, experiences and communications (Citrin et. al., 2000). Joseph and Vyas (1984) operationalized the construct, which is a cognitive style that includes an individual’s intellectual, perceptual, and attitudinal characteristics. An individual who scores high on this trait is open to new experiences and places a premium on different and novel stimuli, particularly of the meaningful sort (not just thrill-seeking). Such a person will easily recognize the potential application of ideas he/she gets from others. More importantly, he/she tries to improve upon these ideas to suit his/her needs. Following Citrin et. al. (2000), we propose:

\[ H2 \]: Increases in open-processing innovativeness will result in increases in consumer adoption of the Internet for shopping.
Domain-specific innovativeness

Another measure of innovativeness is the so-called domain-specific innovativeness. Most studies of innovativeness are conducted within a specific product field and thus the measures used are designed for this same level of specificity (Goldsmith and Flynn, 1992). Domain- or product category-specific innovation reflects the tendency to learn about and adopt innovations within a specific domain of interest, and therefore taps a deeper construct of innovativeness that is more specific to an area of interest (Citrin et. al., 2000). This implies that consumers who are likely to adopt the latest new product in one field may be laggards in another (Goldsmith, d’Hauteville and Flynn, 1998). With reference to the Internet, we propose that a domain-specific measure of innovation may be a good indicator of a person's adoption of Internet shopping:

\[ H3: \text{Increases in domain-specific innovativeness will result in increases in} \]
\[ \text{consumer adoption of the Internet for shopping.} \]

Moderating role of innovativeness

While the Internet presents unlimited opportunities to businesses (Peterson, 1997) and is an important source of product-related information for its users (Gupta & Chatterjee, 1997), on-line transactions have significantly lagged behind information seeking. Citrin and his colleagues (2000) suggest that for those consumers who are more innovative, the general use of the Internet may lead to its use for commercial purposes. Innovativeness is expected to play a facilitating role whereby consumers are driven to use the Internet in a new and novel way for shopping. Thus we propose the following:

\[ H4a: \text{The relationship between Internet usage and Internet shopping will be} \]
\[ \text{moderated by open-processing innovativeness.} \]

\[ H4b: \text{The relationship between Internet usage and Internet shopping will be} \]
\[ \text{moderated by domain-specific innovativeness.} \]
All the four hypotheses are illustrated in Figure 1 below.

![Figure 1: Conceptual Model of Internet Shopping (adopted from Citrin et. al. 2000).](image)

**METHODOLOGY**

**Sample**

Information about consumer characteristics and their self-reported Internet-related behaviour was collected using a short survey questionnaire (see Appendix 1). The survey was carried out at the City Hall Mass Rapid Transit (MRT) station on a weekday and a weekend. The systematic random sampling method was adopted and 1 out of every 5 passer-bys was surveyed. Only respondents who were Internet users were required to complete the survey. A total of 154 completed questionnaires were collected. The average demographic characteristics of our sample were young adults (average age was 26 years old), 53 percent were female and a majority reported a mean monthly income of S$2,000.
Measures and validation

Open-processing innovativeness

The scale developed by Joseph and Vyas (1984) was adapted to measure open-processing innovativeness. Our measuring instrument consists of 12 statements equally divided between open and cautious statements (anchored with "does not describe me well at all" and "describes me extremely well") and the respondents were asked to rate themselves on a five point Likert scale (please refer to Question 3 of the questionnaire). Openness is assessed with items such as “I like to try new and different things,” and “I often try new brands before my friends and neighbours do.” Items representing a cautious style are: “I feel that too much money is wasted on new styles,” and “I like to wait until something has been proven before I try it.” The open-processing score is determined by subtracting the score of the 6 cautiousness items from the summated score of the 6 openness items. A high individual score indicated a more open and innovative individual. The open statements showed a standardized $\alpha$ of 0.71, which is above the average of 0.70 recommended to establish a scale's reliability. The scale's mean and standard deviation were, respectively, 2.87 and 0.95. The cautious statements showed a standardized $\alpha$ of 0.70, with mean and standard deviation of 3.10 and 0.86 respectively.

Domain-specific innovativeness

The scale developed by Goldsmith and Hofacker (1991) was modified to measure domain-specific innovativeness for the World Wide Web (WWW). The scale included six five-points Likert-type scale items anchored with “strongly disagree” and “strongly agree”. The questions were coded so that a high score reflected higher levels of innovativeness. The mean response to these six items provides a domain-specific innovativeness score. Table 1 shows the scale items used for its measurement, which is taken from Citrin et.
al.’s (2000) study. This scale yielded a standardized $\alpha$ of 0.78 (again above the recommended level of 0.70). The scale's mean and standard deviation were, respectively, 2.95 and 1.08.

**Table I: Scale Items for Domain-Specific Innovativeness$^a$**

<table>
<thead>
<tr>
<th>Scale items$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 In general, I am among the last in my circle of friends to visit a company’s new Web site when it appears on the WWW$^c$</td>
</tr>
<tr>
<td>2 If I heard that a new retail site was available on the Web, I would not be interested enough to shop from it$^c$</td>
</tr>
<tr>
<td>3 Compared to my friends, I seek out relatively little information over the WWW$^c$</td>
</tr>
<tr>
<td>4 In general, I am the last in my circle of friends to know of any new retail Web sites$^c$</td>
</tr>
<tr>
<td>5 I will visit a new company’s Web site even if I have not heard of it before</td>
</tr>
<tr>
<td>6 I know about new retail Web sites before most other people in my circle do</td>
</tr>
</tbody>
</table>

Notes:
$^a$ Items on this scale were scored on a five-point Likert-type scale anchored with strongly disagree (1) and strongly agree(5).
$^c$ Indicates that items were reversed coded.

**Internet Usage**

Internet usage was measured by posing the question: Please estimate how many hours per week you use the Internet for the following purposes: a) communication (e.g. to send e-mail) and b) search tool for education or for entertainment. Responses to these two items were averaged to form a single variable. The variable’s mean and standard deviation were, respectively, 5.77 and 3.71 hours.

**Use of the Internet for shopping**

The dependent variable, adoption of the Internet for shopping, was obtained by asking respondents to estimate how often they used the Internet to determine the brand that they wished to purchase *and then bought*
it over the Internet. The response scale included 6 points ranging from “0 times” to “5 times or more” in the past year. The item's mean and standard deviation were, respectively, 0.88 and 1.91.

THE EMPIRICAL ANALYSIS

The main effects of Internet use, domain-specific and open-processing innovativeness, in addition to each of the innovativeness’ interactions with Internet usage were included as independent variables. The variable Internet shopping was used as the dependent variable. Interaction terms had to be formed since our hypotheses involved testing for the moderating effects of domain-specific and open-processing innovativeness on the relationship between Internet usage and its adoption for shopping.

To test our hypotheses, we conducted a multiple regression analysis with the two interaction terms and the main effects entered into the regression equation. The model was also tested for the assumptions of multiple regression, namely normality and independence, through residual analysis. Results showed that the assumptions of regression analysis were not violated. However, multicollinearity existed when the regression was run with the interaction terms. Hence we are not able to test for any moderation effects. Next, we conducted another regression analysis without the interaction terms to test our first three hypotheses. The results are summarized in Table 2.
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Table II: Regression results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-processing innovativeness (OPI)</td>
<td>0.060575</td>
<td>0.027805</td>
<td>0.030928</td>
</tr>
<tr>
<td>Domain-specific innovativeness (DSI)</td>
<td>0.606087</td>
<td>0.209026</td>
<td>0.004298</td>
</tr>
<tr>
<td>Internet usage</td>
<td>0.170197</td>
<td>0.038661</td>
<td>2.02E-05</td>
</tr>
</tbody>
</table>

F = 17.314*

Adjusted $R^2 = 0.2424$

Note: * Significant at $p < 0.05$

**RESULTS**

Our first hypothesis states that individuals with higher levels of Internet usage are more likely to engage in electronic commerce. Table 2 reveals a significant positive relationship between Internet usage and Internet shopping ($b = 0.170197$, $p$-value = 2.02E-05). This supports Citrin et. al.'s findings (and our hypothesis) that higher levels of Internet usage are more likely to lead to the adoption of the Internet for shopping purposes.

The second hypothesis states that increases in an individual's open-processing innovativeness would result in increases in Internet shopping. Results from our regression analysis support this hypothesis ($b = 0.060575$, $p$-value = 0.030928). Increase in open-processing innovativeness does have a significant effect on the adoption of Internet for shopping. Our finding differs from Citrin et. al.’s (2000) study in that they found no significant relationship between OPI and the adoption of Internet for shopping. The difference in results could be due to the different samples involved. Our respondents are the general public as opposed to their survey of
undergraduates. Undergraduates may be more sensitive to DSI rather than OPI due to their higher level of education. They may be more “innovative” in certain fields, and in this case, the Internet.

The third hypothesis predicts that increases in an individual's domain-specific innovativeness would result in increases in Internet shopping. The proposition is supported by our data \( (b = 0.606087, p\text{-value} = 0.004298) \). We find a significant and positive relationship between domain-specific innovativeness and the adoption of the Internet for shopping. Our conclusion is the same as Citrin et. al.’s. Due to the presence of multicollinearity, hypothesis 4a and hypothesis 4b cannot be tested.

**SUMMARY AND IMPLICATIONS**

Innovativeness is an individual level construct that measures a person’s reactions to the new and different (Goldsmith, Flynn and Goldsmith, 2003). The level of consumer innovativeness could presumably help marketers identify early adopters of their products. This is very important in two respects. Firstly, early adopters contribute to the initial sales of a new product or service. Secondly, these early adopters provide important word-of-mouth communication about the new product/service to later adopters.

The purpose of this research is to gain a better understanding of those factors that might move consumers from being simply informational users of the Internet to adopters of the Internet for shopping. The results of our study indicate that each of the three main factors, Internet usage (for purposes other than shopping), domain-specific innovativeness and open-processing innovativeness, have a direct influence on consumers' adoption of Internet shopping. Domain-specific innovativeness was found to have the biggest impact on the adoption of the Internet for shopping \( (b=0.61) \). In addition, Internet usage was found to have the second strongest effect on Internet shopping behavior \( (b=0.17) \). Open-processing innovativeness seems to have the least impact \( (b=0.06) \).
Since both open-processing innovativeness and domain-specific innovativeness have positive effects on consumer adoption of the Internet for shopping, marketers of products on the Internet may want to develop the means by which they can nurture both general innovativeness and Internet-related innovativeness among consumers. For example, marketers can create Internet sites that facilitate and reward exploration and thereby influence the Internet users to become more domain-specific innovative. This in turn should lead them to undertake more Internet shopping. Future academic studies can identify the means through which this learning process is facilitated. Experiments can be conducted to determine how the characteristics and behavior of innovative consumers differ on online shopping, as compared to the more traditional web users. For example, how do the more innovative consumers react to online advertisements, promotions, price and other marketing stimuli?

Our finding that domain-specific innovativeness has a stronger effect than open-processing innovativeness on Internet shopping leads to some important implications for marketers in their efforts to better understand their customers and formulate marketing strategies. While the consumers who are purchasing products over the Internet may not be considered as innovative in the broadest sense of the term, they are definitely more innovative in the domain of the World Wide Web. To capture this group of customers, companies need to evaluate the feasibility and the means of expending marketing dollars on Internet marketing.

The moderating effects of OPI and DSI on the relationship between Internet usage and Internet shopping adoption cannot be tested due to multicollinearity. The relatively low $R^2$ of 0.24 obtained for the model shows that consumer innovativeness is only one of the many variables affecting the adoption of Internet shopping. While the results are significant, other factors such as demographics could have an impact on Internet shopping. Hence, a more extensive study including other factors, together with the role of consumer innovativeness, should yield better predictions for future researchers.
As noted by Citrin et. al. (2000), the Internet is only one of several new media options available to consumers to conduct retailing transactions. With the future promising many additional retailing media options, a sound understanding of the determinants of the adoption of Internet shopping will provide a useful foundation for exploring new business opportunities.

REFERENCES


SURVEY QUESTIONNAIRE

Section A:

1. Please estimate how many hours per week you use the Internet for the following purposes:
   a) communication (e.g. to send e-mail),
      ___________ hours
   b) search tool for education or for entertainment.
      ___________ hours

2. How often do you use the Internet to determine the brand that you wish to purchase and then bought it over the Internet?
   - 0 times
   - 1 time
   - 2 times
   - 3 times
   - 4 times
   - 5 times
   If it is more than 5 times, please specify: ___________ times

3. On a five-point scale, to what extent do you think the following statements describe you? Please circle the appropriate point, with 1 being Not Well At All and 5 being Extremely Well.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Well At all</th>
<th>Not Well</th>
<th>Fairly Well</th>
<th>Very Well</th>
<th>Extremely Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I like to try new and different things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) I often try new brands before my friends and neighbours do</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c) When I see a new brand on the shelf, I often buy it to see what it is like</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d) I like taking a chance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e) I like to talk to strangers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f) When it comes to taking chances, I would rather be safe than sorry</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>g) I feel that too much money is wasted on new styles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>h) I like to wait until something has been proven before I try it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>i) If I buy appliances, I will buy only well-established brands</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>j) I often go shopping with a specific need</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>k) I feel apprehensive about trying out new things</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>l) I always shop where it saves me time</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
4. On a five-point scale, to what extent do you agree with the following statements? Please circle the appropriate point, with 1 being Strongly Disagree and 5 being Strongly Agree.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Fairly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) In general, I am among the last in my circle of friends to visit a company's new Web site when it appears on the WWW</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b) If I heard that a new retail site was available on the Web, I would not be interested enough to shop from it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c) Compared to my friends, I seek out relatively little information over the WWW</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d) In general, I am the last in my circle of friends to know of any new retail Web sites</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e) I will visit a new company's Web site even if I have not heard of it before</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f) I know about new retail Web sites before most other people in my circle do</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Section B:**

Please provide the following information to further aid us in our analysis:

**Gender:**
- [ ] Male
- [ ] Female

**Marital Status:**
- [ ] Single
- [ ] Married

**Age group:**
- [ ] 16yrs and below
- [ ] Between 17yrs and 20yrs
- [ ] Between 21yrs and 25yrs
- [ ] Between 26yrs and 30yrs
- [ ] Above 36yrs

**Profession:**
- [ ] Student
- [ ] Clerical
- [ ] Sales
- [ ] Professional
- [ ] Supervisor/technical executive
- [ ] Manager/admin executive
- [ ] Others, please specify: ____________________
Monthly Income:
- $1000 and below
- $1001–$2000
- $2001–$3000
- $3001–$4000
- Above $4001

Educational level:
- Primary
- Secondary
- College/Pre-U
- Technical/vocational
- Polytechnic/Diploma
- University and above

Credit Card Ownership:
- Yes
- No