The Relationship between Innovation And Consumption of Internet Users

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Abstract: The relationship between innovation and consumption among internet users is not uniform. This research shows different relationships between innovation and consumption in terms of the level of involvement in music from an internet survey of 1,000 music users. We measure the level of involvement in music using the two levels of components of involvement suggested by Lastovicka and Gardner (1979). For the analysis, we divide the samples into the “high involvement” and “low involvement” groups and examine each group for their relationship between innovation, indicated by “making one’s own music and posting one’s songs or performances on the internet,” and consumption, indicated by “average amount of money spent on music downloads per year.” The results show that there are heterogeneous characteristics among high and low levels of involvement groups in the aspects of consumption and innovation behavior. In the low involvement group, users actively innovating are also actively consuming. However, in the high involvement group, there is no clear relationship between innovation and consumption. To put it concretely, the consumption per innovating user is approximately

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four times more than that of non-innovating users in the low involvement group, but it is about the same in the high involvement group. In addition, the consumption per innovating user in the low involvement group is approximately two times more than that of innovating users in the high involvement group.

Keywords: user innovation, UGC, consumption, involvement, music, internet users

1. Introduction

In recent years, consumers using the internet have become more active with the development of ICT environment. At the same time, there has been a focus on new activities that cannot be unraveled by existing consumer studies or innovation management.

Innovating activities or performances of users or consumers are called “user generated content (UGC)” in marketing and “user innovation” in innovation management. While prior researches have focused on the relationship between innovation and motivation, attribute of users, communities, or encouraging systems, they have not considered consumption.

Therefore, this research shows how the relationship between innovation and consumption among internet users changes based on their level of involvement (or interest) in music.¹

The results show that in the low involvement group, users actively innovating are also actively consuming, whereas in the high involvement group, there is no clear relationship between innovation and consumption.

¹ Katsumata (2008) is an example of research focusing on music.
2. Previous Research

In innovation management, researchers tend to focus on one organization (Katz & Allen, 1982; Schumpeter, 1926; Takahashi & Inamizu, 2012, etc.). However, in recent years, the focus has been on innovations outside an organization or inter-organizational relations (Brusoni, Prencipe, & Pavitt, 2001; Chesbrough, 2003, etc.).

In particular, internet users have become one of the main topics of innovation research (Fujita & Ikuine, 2013; Ghose & Han, 2011; Lerner & Tirole, 2002; Mallapragada, Grewal, & Lilien, 2012; Nojima, 2004). Research on innovation management about internet users has broadly focused on two main issues: attributes of innovating users and factors encouraging user innovation (Ichikohji, 2010). Regarding the attributes of innovating users, researchers use the following factors: lead users (Franke & Shah, 2003; Lüthje, 2004), product knowledge (Schumacker & Kuester, 2012), and career (Ghose & Han, 2011; Jeppesen & Frederiksen, 2006).

Regarding the factors encouraging user innovation, two main arguments exist. One of the arguments is the relation to companies. Preparation of tools or product development, which simplifies and assists users to innovate (Franke & von Hippel, 2003; von Hippel, 2001), and recognition or encouragement of user innovations by companies (Jeppesen & Frederiksen, 2006) promote innovation. The second argument is the relation to other users or communities. In addition, reputation or feedback from other users (Lerner & Tirole, 2002; Mallapragada, Grewal, & Lilien, 2012), participating in the innovation of other users (Hienerth & Lettl, 2011), and support from other innovative users (Jeppesen, 2005) promote innovation.

On the other hand, these studies focus on the issues of how users face needs that will be general in a market place months or years later and are positioned to benefit significantly by obtaining a solution to those needs (von Hippel, 1986).
innovate, or how to get them to innovate. Thus, it is not sufficiently clear whether innovating users will become a source of profit, except for their own innovation.³

Therefore, this research aims to analyze the relationship between innovation and consumption among internet users.

3. Methodology

Through an online survey, we collected the following two measures: innovation and consumption on the internet. In addition, we collected the involvement construct to examine the impact on the objective product category. The innovation behavior was measured using the binary scale “0, No” and “1, Yes” for the following statement: “I post my own songs or performances on the internet.” On the other hand, the consumption behavior was measured using the positive continuous scale for the following question: “What is the average amount of money you spend per year on music downloads?” The respondents wrote in the amount directory. In this research, we used the components of involvement (CI) scale proposed by Lastovicka and Gardner (1979) as an involvement measure. The CI scale has 22 items; therefore, we used the average of items to obtain the construct value. The items are listed in the appendix.

The characteristics of the 1,000 respondents who participated in this survey are as follows. All respondents were students between the ages of 18 and 24 living across Japan. Regarding sex, 43.2% were male and 56.8% were female. Regarding education, 90.5% were university students, 8.5% were graduate students, and 1.0% attended vocational schools. Because there are very few consumers who generate their own content, we need to collect large number of

³ As examples, Katsumata and Ichikohji (2010) analyze the relationship between consuming users and innovating users. However, it is not sufficient.
samples.

For the analysis, we divided the samples into two groups. The first group was of the lower two-thirds in the level of involvement, that is, the “low involvement” group. The people of this group have relatively low level of interest in music and can be seen as a part of the general public. The second group was the upper one-third with a high level of involvement. The people of this group take interest in and, particularly, like music.

Thereafter, we examined the relationship between consumption and innovation. Thus, because “innovation” is a binary metric, we use a t-test of the differences between average scores for the two groups.

4. Results

Figure 1 shows the results of the analysis. There is a positive, significant relationship at the 5% level between consumption and innovation in the low involvement group (|t| = 2.22, p = 0.039). In

![Diagram showing relationship between consumption and innovation for low and high involvement users]

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**Figure 1.** Relationship between consumption and innovation

*Note: n.s. = not significant*
other words, innovating users tend to be more valuable consumers than non-innovating users, whereas in the analysis of the high involvement group, there is no significant relationship between consumption and innovation ($|t| = 0.41, p = 0.684$).

Figure 2 shows the consumption levels in order to examine the relationships in more detail. First, in the low involvement group, there is a significant relationship between consumption and innovation at the 5% level. The average score of consumption per innovating user is 11,174 yen, approximately four times more than that of non-innovating users, who consumed 2,873 yen. While in the high involvement group, there is no significant relationship. The average score of consumption per innovating users is 5,226 yen, approximately the same as that of non-innovating users, who consumed 5,814 yen, and somewhat reversed.

When comparing innovating users in both high and low involvement groups, the average consumption of innovating users
with low involvement was 11,174 yen, approximately twice that of the group with high involvement. However, a statistical test shows significance at the 10% level with $|t| = 2.18$, $p = 0.069$; thus, indicating that this difference requires further study. The t-test result of non-innovating users in both groups with high and low involvement is $|t| = 3.23$, $p = 0.001$. The average consumption of non-innovating users with high involvement is significantly higher than that of non-innovating users with low involvement at the 1% level.

These results show that there are heterogeneous characteristics among high and low levels of involvement groups in the aspects of consumption and innovation behavior. First, in the low involvement group, users actively innovating were also actively consuming. However, in the high involvement group, there was no clear relationship between innovation and consumption.

5. Discussion

Why do innovation and consumption unlink at higher levels of involvement? Our hypothesis is that as levels of involvement increase, users focus on either innovation or consumption. Table 1 shows the frequency and results (chi-square and $p$ values) of the test of independence (chi-square test) when the threshold value equals the overall average consumption (4,027.8 yen). According to this table, there is no statistical trend toward focus in the high involvement group. However, there is at least a trend toward heterogeneity between the low and high involvement groups.

This process of structural change is not yet sufficiently clear. Thus, validating this process in detail requires dynamic observations of involvement because involvement only gradually changes over the long term. Observing the growth path of users by measuring changes in their levels of involvement over a long-term period, it may be
It is possible to uncover new findings. For example, further research may show whether users who are actively innovating and consuming in the low involvement group reduce their consumption with increasing levels of involvement, or experience high level of involvement, and decrease back to the current level.

In addition, further research is required to develop five-point scales of measurement for observing growth stages of innovation activity.

In testing the hypothesis, it is also optimal to consider internal characteristics of users that determine consumption and innovation. For example, there is a metric to measure the level of consumer expertise in the field of consumer behavior studies. The “fashion leader” defined by King (1965) and Goldsmith, Freiden, and Kilsheimer (1993) is aggressive in obtaining new information on their target and plays an important role in the diffusion of product and information. In other words, this is a characteristic of consumers playing an important role in information transfer other than product innovation, and it is considered that users with a high value in this

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<th>Non-innovative</th>
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<td><strong>Low involvement users</strong></td>
<td></td>
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</tr>
<tr>
<td>High level consumption</td>
<td>10</td>
<td>118</td>
</tr>
<tr>
<td>Low level consumption</td>
<td>13</td>
<td>525</td>
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*Note: $\chi^2 = 9.03, p = 0.00$ (significant at 1% level)*

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<td><strong>High involvement users</strong></td>
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<tr>
<td>High level consumption</td>
<td>15</td>
<td>103</td>
</tr>
<tr>
<td>Low level consumption</td>
<td>16</td>
<td>200</td>
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*Note: $\chi^2 = 2.55, p = 0.11$ (not significant)
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metric focus on consumption. Furthermore, the field of user innovation research suggests “leading edge status” as a characteristic of consumers that innovate (Jeppesen & Frederiksen, 2006; Morrison, 1995; Morrison, Roberts, & von Hippel, 2000). Consumers with a high value in this metric are considered to focus on innovation. However, Morrison, Roberts, and Midgley (2000) and Katsumata (2011) note great correlations between the consumption expert metrics and leading edge status, and further study is required to analyze the relationship.

References


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Appendix: Measures

Components of Involvement (Cronbach’s alpha = 0.88)
1. This is a product that I could talk for a long time.
2. I understand the features well enough to evaluate the brands.
3. This is a product that interests me.
4. I have a preference for one or more brands in this product class.
5. (R) This is a product for which I have no need whatsoever.
6. (R) I am not at all familiar with this product.
7. I usually purchase the same brand within this product class.
8. (R) If I had made a brand choice in this product class before actually making the purchase, I might easily change my intended choice upon receiving discrepant information.
9. If I received information that was contrary to my choice in this product class, I would—at all costs—keep my choice.
10. (R) I can protect myself from acknowledging some basic truths about myself by using this product.
11. (R) If my preferred brand in this product class is not available at the store, it makes little differences to me if I must choose another brand.
12. My use of this product allows others to see me as I would ideally like them to use.
13. This product helps me attain the type of life I strive for.
14. I can make many connections or associations between experiences in my life and this product.
15. I definitely have a “wanting” for this product.
16. If evaluating brands in this class, I would examine a very long list of features.
17. I use this product to help define and express the “I” and “me” within myself.
18. I rate this product as being of the highest importance to me personally.
19. Because of my personal values, I feel that this is a product that ought to be important to me.

20. Use of this product helps me behave in the manner that I would like to behave.

21. Because of what others think, I feel that this is a product that should be important to me.

22. (R) Most of the brands in this product class are all alike.

Note: All measures employ 5-point scales. (R) indicates reverse score items.