The Research Review and Prospect on the Lead User

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Abstract. Under the trend of democratizing innovation, lead user becomes an important research object in the field of innovation. Lead user, as an important strategic resource, is at the leading edge of important market trends which will popular in the near future, and they anticipate obtaining relatively high benefits from exploring a solution to their needs. In this paper, the definition, characteristics and function are detailed firstly. Then, the status quo of lead user is introduced, and related research review and the shortage of present research are put forward. Afterwards, an identifying criterion system is built. And finally, the latest trend and further research direction are analyzed.

Introduction

For enterprises, technological innovation is an important way to acquire sustainable competitiveness, and how to make market position and identify user requirements is the primary problem needs to solve. Nevertheless, as user needs constantly become heterogeneous, traditional market research methods are not able to meet the needs of the enterprise and the development trend of the market. Based on this, Professor von Hippel of MIT put forward the concept of Lead User firstly which is distinguished from normal users. This new theory emphasizes the role of lead users in the early stage of innovation, and provides a feasible and effective method to seize market trends from the perspective of users. This paper proposes to explain the connotation, characteristics and function of lead user, and summarize the relevant research status quo in the area of lead user aiming at building an identifying criterion system of lead user and discussing its further research direction.

Overview of Lead User

Lead user is the part of users who want to obtain massive profits by innovation. They try to meet their own needs, and provide manufacturers with valuable innovative ideas and prototype designs with serving as a demand forecasting lab for market investigator. Therefore, lead user is a subset of user group which is most close to market trend.

Relative to normal user, lead user has two distinguishing characteristics. First, they are at the leading edge of important trends, and so are currently experiencing needs that will later be experienced by many other users in that marketplace. Second, they anticipate obtaining relatively high benefits from exploring a solution to their needs [1].

After that, the concept of lead user gets stretch. Morrison (2000) presented the concept of Leading Edge Status (LES)[2], and considers LES perceived by the user himself and others is
also a characteristic of lead user. Gurgul et al. (2002) point out that lead user has more abundant life experience and product knowledge. Luthje (2004) thinks lead user has relatively higher expected benefits and more relevant knowledge[3]. Besides, lead user has certain ability of undertaking risks from the process of innovation, and also be good at acquire relevant knowledge and technique by using internet technology.

In conclusion, lead user has following characteristics. First, lead user has demands in advance which will become general in a marketplace months or years in the future. Second, lead user is positioned to benefit significantly by obtaining a solution to those needs. Third, lead user tends to issue their own innovations freely so that manufacturers could benefit from lead users’ behavior of innovation. Fourth, lead user has rich professional knowledge and design and development skills, and could acquire edges related to product development by internet. Fifth, lead user explores to improve their solutions constantly through trial and error.

Lead user tends to share their innovation with others which anyone could test, imitate, modify and use freely. For enterprises lead users serve as a crucial external resource which has great significance for information acquisition, cooperation innovation with users and technological innovation. Research on lead user helps enterprises to better understand and get market information, and obtain higher quality product and service concepts, and then accelerate the development process of product and service [4]. Therefore, study the theory of lead user and identify them are critical to implementing the strategy of user innovation

The Innovation Motives of Lead User

Due to the differences in consumption situation, users of industrial products and consumer products may be different in innovation impetuses. Shah (2000) point out that innovative users acquire benefits by using innovative products, getting social prestige, applying for patents and selling innovative products, with a long study of consumer-products industry[5].

From the aspect of economics, one of the innovation impetuses of lead user to innovate is obtaining benefits which are innovation-related rents. When users’ expected benefits exceed expected costs, the exceeding benefits motive lead users to innovate. That is the fundamental factor that encourages users to innovation. Furthermore, innovation impetuses of lead user contact sticky information [6], psychic gratification and happiness experienced in the process of innovation, and manufacturers’ invitation [7]. Hong-yu Tan (2008) considers that innovation motives of lead users include intrinsic motives and external motives [8]. Intrinsic motives include increasing their knowledge, improving development skills, acquiring the sense of achievement, pursuing the pleasure of innovation etc., and external motives contain users’ needs for a product function, social honor, direct rewards and deferred rewards.

The Identification of Lead User

The Identification Procedure of Lead User

There are four steps to identify lead user. First, an indicator system of lead user is needed. We get a new development trend of related product through expert consultation. In the meanwhile, we estimate whether users in the area have a high benefits expectations by market and users survey. Second, setting up a lead user group, identify lead user from target user group, and finding lead user with strongest innovation ability and highest innovation intention. Third, cooperating with the lead user, and designing products. Fourth, testing the market attractiveness of lead users’ innovative outcomes.
The Identification Methods of Lead User

There are mainly two methods to identify the lead user, which are questionnaire survey and telephone network method. The former one needs to contact with every user of the target user group, however, there are only small number of lead user in a target group. That’s why this method is time-consuming, higher cost and lower efficiency, but can identify all the lead users in target group. Telephone network method is appropriate for the condition that lead users are relatively scattered, and do not need to identify all the lead users.

In addition, China’s scholars also pay attention to this area. Hong-yu Tan (2008) put forward a new identification method of lead user based on the fuzzy hierarchy analysis [8]. Wei Wu (2010) considers that enterprises should focus on these three kinds of users in the process of identifying lead user: lead user in the similar market, lead user in target market, and lead user related to the important properties faced by target users [9]. Bo Yang (2011) constructs a model of lead user identification by Statistics and Probability [10].

The Identification Indicators of Lead User

About the specific indicators of lead user, apart from innovation expectation and demand trends put forward by Professor Von Hippel, there are LES perceived by users and others, and lead users’ life experience, product knowledge, expected benefits and related skills. There is still not a universal and scientific evaluation index about lead user in existing research. In this paper, we trying to replenish this insufficient, based on present theory and current situation. The detailed indicator system of lead user is shown as Table 1, which contains five dimensionalities.

1. Leading Edge
   Leading Edge means lead user is in the frontier of important market trend, and their needs will be popular in the future. Leading Edge not only means taking the lead in demand but also in technology, due to the fact that lead user group includes some experts with professional technical capability. Therefore, there are two indictors of this dimensionality. There are demand-leading and technology-leading.

2. Profits Expectation
   The second dimensionality of lead user is Profits Expectation, which means lead user has an expectation to get relatively higher innovation benefits. Profits Expectation stimulates lead user to explore the solutions to their needs and innovate. The dimensionality of Profits Expectation is measured by three specific indicators: benefits in use, social benefits and economic benefits.

3. Innovation Intention
   Innovation Intention is a trend reflected in lead users’ psychology and behavior when they involve in innovation. There are two aspects of the connotation of Innovation Intention. One hand is innovation consciousness, which means if lead user is willing to invest in an innovation, and try to figure out the problem. The other hand is that if lead user would take part in innovation positively. In consequence, the dimensionality of Innovation Intention has two indicators of innovation consciousness and participation tendency.

4. Innovation Ability
   Innovation Ability means if lead user is qualified to innovate. Innovation Ability includes creative thinking ability, learning ability and information processing ability. Creative thinking ability means lead user has good divergent thinking and product ideation. Learning ability signifies that lead user is capable in obtaining, learning and absorbing knowledge needed. The
indicator of information processing ability measures lead users’ ability of acquiring and extracting information. Information processing ability includes both the diversity of information acquisition methods and the ability of information arrangement.

(5) Collaboration Ability

Collaboration Ability, namely team-work ability, involves in the process of cooperation innovation between lead user and enterprises. An important side of Collaboration Ability is collaboration consciousness, which requires lead user has spirit of cooperation and sharing. The relationship constructed on the basis of equality and mutual benefit will make the both side commit to a common goal. The other side of Collaboration Ability is interpersonal communication which is the basis of cooperation innovation. Interpersonal communication contains good language expression and communication skills.

Table 1. The detailed indicator system of lead user.

<table>
<thead>
<tr>
<th>Indicator type</th>
<th>Indicator</th>
<th>Indicator description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading Edge</td>
<td>Demand-leading</td>
<td>The demand of lead user is novel.</td>
</tr>
<tr>
<td></td>
<td>Technology-leading</td>
<td>Lead user has leading technical expertise related to the innovation.</td>
</tr>
<tr>
<td>Profits Expectation</td>
<td>Benefits in use</td>
<td>Lead user can meet the needs by innovation.</td>
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<tr>
<td></td>
<td>Social benefits</td>
<td>Lead user can get a sense of achievement by exploring problem-solution.</td>
</tr>
<tr>
<td></td>
<td>Economic benefits</td>
<td>Lead user can get monetary income by exploring problem-solution.</td>
</tr>
<tr>
<td>Innovation Intention</td>
<td>Innovation</td>
<td>Lead user is disposed to invest in an innovation.</td>
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<td></td>
<td>consciousness</td>
<td>Lead user is disposed to figure out the problem constantly.</td>
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<td></td>
<td>Participation</td>
<td>Lead user finds the problem, and communicates with enterprises positively.</td>
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<tr>
<td></td>
<td>tendency</td>
<td>Lead user takes the initiative to cooperate with enterprises and put forward opinions and suggestions.</td>
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<td></td>
<td></td>
<td>Lead user is familiar with the product and service.</td>
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<tr>
<td>Innovation Ability</td>
<td>Creative thinking</td>
<td>Lead users’ product conceptions are novel and creative.</td>
</tr>
<tr>
<td></td>
<td>ability</td>
<td>Lead user has good divergent thinking.</td>
</tr>
<tr>
<td></td>
<td>Learning ability</td>
<td>Lead user is capable in obtaining, learning and absorbing knowledge needed.</td>
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<tr>
<td></td>
<td>Information</td>
<td>Lead user has various information acquisition channels and methods.</td>
</tr>
<tr>
<td></td>
<td>processing ability</td>
<td>Lead user has a high ability of information analyzing, concluding and summarizing.</td>
</tr>
<tr>
<td>Collaboration Ability</td>
<td>Collaboration</td>
<td>Lead user has the spirit of cooperation and sharing.</td>
</tr>
<tr>
<td></td>
<td>consciousness</td>
<td>Lead user takes part in the process of problem-solution actively.</td>
</tr>
<tr>
<td></td>
<td>Interpersonal</td>
<td>Lead user is willing to share knowledge, experience and information with others.</td>
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<tr>
<td></td>
<td>communication</td>
<td>Lead user has good communication skills.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lead user has good language expression ability.</td>
</tr>
</tbody>
</table>
Summary

Researches on lead user start from 1980s. And with decades of development, a large number of research achievement are obtained, which make us have d deep understanding of related problems. However, there still exist lots of problems in this area. Future research would be launched in the following aspects.

(1) Existing research are mainly conducted in qualitative analysis, researches in quantitative analysis are rare. The outcome is that there is a deviation between research results and reality. In future, more quantitative analysis and case study are needed to perfect the theory of lead user.

(2) An integrated system of lead user management is in absence. Lead user, as a pivotal strategic resource, should be managed and developed scientifically and rationally by enterprises. Effective measures include establishing appropriate incentive mechanism, allocation mechanism, and communication mechanism and so on.

(3) There is no clear standard in the measurement and evaluation of lead users’ innovation performance. It is accepted that lead user, plays the part of enterprises’ external wisdom, has important implications for improving enterprises’ innovation performance. More attention should be paid to this direction.

(4) There are almost no existing researches aiming at the risks in the application of lead user in innovation. Future research should pay close attention to this area which is significant for perfect the theory of lead user and user innovation.

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