Knowledge Sharing Efficiency Analysis Model Design of Internet Open Innovation Community

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The emergence of Internet technology has changed the technological innovation path and knowledge acquisition paradigm of enterprises and promoted the construction of digital technology, digital platform, and digital infrastructure. A large number of companies have begun to create brand communities and obtain suggestions for product improvement and innovation from the communities. However, obtaining innovative opinions and inspiration through the community to the final realization is not achieved overnight. It needs to go through the process of knowledge sharing to user interaction, from user interaction to knowledge creation and discovery and from knowledge discovery to innovation contribution. To study the efficiency of Internet community innovation, it is necessary to decompose the innovation process into two parts: problem adoption and problem solution, and then analyze them separately to get the influence combination and path. Taking Xiaomi (one of the world’s largest mobile phone manufacturers) online community as an example, this article decomposes the process of issue solution into adoption stage and solution stage by crawling the relevant data of posts through web crawlers, takes the adoption efficiency and problem-solving efficiency as antecedents, and uses fuzzy set qualitative comparative analysis method to analyze the combination of conditions that affect the former two. It is of great significance to improve the knowledge sharing and innovation research of the open innovation community.

1. Introduction

With the increase in the number of manufacturers and the types of goods in the market, consumers have higher requirements for purchasing products. In order to cope with the changes in the market, enterprises maintain the original market by improving the shortcomings of their products and constantly carry out technological and product innovation, expecting to expand the market scale. The emergence of new and powerful Internet technology promotes the construction of digital technology, digital platform, and digital infrastructure, and changes the path of technological innovation and knowledge acquisition paradigm of enterprises to a great extent, so that enterprises cannot carry out closed innovation as in the past. They should refer to external ideas while seeking technological progress. Chesbrough calls this new model open innovation. NASA, Toyota, P&G, IBM, Xiaomi, Starbucks, Haier, and other enterprises have realized the importance of open innovation, and began to put the technical problems encountered by enterprises on the platform, hoping that third-party personnel can provide solutions; or absorb users’ product opinions on the platform, and constantly improve old products and develop new products that meet users’ preferences. Therefore, at the moment when open innovation is widely used, the efficiency of adopting and solving the opinions provided by users of the research platform plays an important role in improving products, accelerating innovation, and developing products that meet the needs of consumers.

2. Literature Review

Digital technology and tools have penetrated into modern business, and have been applied in a variety of companies [1]. The use of digital technology has a significant impact on
the innovation process, redefining the creation of products and services [2]. Chesbrough proposed that companies in the new century should not innovate in a vacuum, but should carry out open innovation, and can refer to external opinions when seeking technological progress [3]. With the rapid advancement of information technology, Internet-based user-generated content continues to emerge, providing sufficient knowledge resources for enterprises’ open innovation. In order to make full use of user-generated content to improve corporate innovation capabilities and maintain competitive advantages, more and more companies have begun to create and use Internet-based user-generated content platforms, that is, open innovation communities, and have gradually become an important platform for companies to gather innovative resources. At present, innovation platforms with relatively mature systems have been established at home and abroad. InnoCentive platform in the United States is the world’s top place for discussion and solutions to problems. Toyota, P&G, and NASA have launched research and development problems on this platform. Starbucks’ mystarbucks idea platform has accumulated 150,000 ideas from users in 5 years [4]; one-third of the R&D innovation of Xiaomi company comes from fans, and 80% of the modification opinions of MIUI system come from users of Xiaomi community [5]; Haier has realized significant financial and innovation benefits through open innovation through the hope platform [6]. Therefore, it is necessary for enterprises to carry out open innovation.

At present, the research on open innovation platform includes the following aspects:

(1) Research on the connotation of open innovation communities: in 2003, Chesbrough introduced the concept of closed and open innovation platform, which defined open innovation as a model. In the open new era, enterprises can use external ideas when seeking technological progress, and combine internal and external ideas into an architecture and system according to the needs of business model [3]. Open innovation community has become an important platform for enterprises to gather innovation resources. Many enterprises relied on the Internet to build a content production and release platform to attract users to directly or indirectly participate in innovation-related activities such as the creativity, R&D, and promotion of enterprise internal products, and carried out high-quality user-generated content creation [7]. Obviously, open innovation community is a platform concept, and its most important constituent element is “knowledge.” Through the combination of external knowledge and internal knowledge, new knowledge is generated, and then enterprise science and technology innovation can be accelerated [8]. In addition, some scholars believe that innovation elements are not only limited to knowledge, but also include a variety of innovation resources. For example, Laursen and Salter [9] believe that the important point of open innovation community is to connect internal and external innovation resources of enterprises, and “user” is also one of the important elements of knowledge collaborative innovation in the open innovation community. The process of technological innovation is no longer completed by enterprises alone. The enterprise can guide users to participate in the innovation of products or services, and promote the innovation of products or services through sharing among users [10].

(2) Through the perspective of social network and social capital, some scholars studied the behavior and motivation of platform users. For example, some scholars have studied the relationship between open innovation network structure and social network caused by user interaction. Starting from the structural dimension, relationship dimension, and cognitive dimension, there is an article that attempted to explore the relationship between three dimensions of social network and its impact on the user innovation participation behavior, and then analyzed its impact on the utilization of enterprise innovation knowledge points, and constructed a relationship model of user participation in innovation and enterprise innovation performance based on social network [11]. From the perspective of social networks, there was an article taking innovation community members as the research object, incorporating them into the social network analysis framework, and describing customer participation in the context of innovation communities from the three dimensions of network characteristics, network behavior, and network capabilities [12].

(3) Research on the main body of open innovation platform. Some scholars have studied that the construction of an open innovation platform for small and medium-sized enterprises under the Internet+ should rely on the external environment and professional management and operation teams, and make full use of the resources of large enterprises [13]. Z.Zhenggang and J.Silong [14] studied the construction of innovation platforms for industrial clusters and classified the platforms according to the role played by the government in the process of platform construction and operation. In the context of digital and open innovation, the most significant change in innovation network is that “customer” or “consumer” has become one of the main bodies of the innovation network. These consumers form clusters, surpassing enterprises, universities, and scientific research institutes, and they provide more and more extensive elements for innovation [15].

(4) Research on platform user behavior. Some scholars analyzed the influencing factors of users’ continuous knowledge-sharing behavior in the open innovation community. It showed that the degree of users’ self-presentation, available social learning opportunities, recognition of enterprises, and recognition of users
with creative sharing experiences had a significant positive impact on users’ continuous creative sharing behavior [16]. Some scholars used data mining to obtain platform data and studied the impact of quantity, quality, and emotion on individual innovation contribution in the open innovation community [17]. Li et al. [18] conducted theoretical research on the characteristics of leading users in open innovation communities, and proposed three characteristics: demand leadership, active expression, and community influence. Then based on the improved weblog method, the qualitative weblog and quantitative data analysis were combined to construct theoretical steps to identify leading users.

(5) Research on platform knowledge sharing and collaborative innovation. The latest research progress in this area has examined how the factors of platform users’ collective or community level affect the actions and decisions of individuals and enterprises in different ways and under different backgrounds. Verstegen et al. [19] combined the analysis of the individual and collective levels of the use of digital technology within the platform, and explained how collective promotion (i.e., the possibility of target-oriented action by multiple members of the group) is implemented by a group of heterogeneous participants. Zhou et al. [20] studied the influencing factors of user knowledge sharing in the open innovation community, and believed that innovation self-efficacy, result expectation, social identity, and community influence have significant positive effects on user knowledge-sharing behavior. Ren [21] and others have studied the factors influencing innovative users’ knowledge sharing in the community under the open innovation paradigm, and explored the development path of their knowledge sharing. These studies indicate that by examining the interaction between individual-level factors and community- (or collective-) level factors, it is expected to have a more detailed understanding of the innovation process of digital platform.

As shown in Figure 1, the Internet open innovation is a process from knowledge sharing to user interaction, from user interaction to knowledge creation and discovery, and from knowledge discovery to innovation contribution.

However, it is of great significance for innovation platforms and communities to discover problems from the final solution of problems in products. Only when users get feedback on problems and convey their opinions to enterprises through the platform, the role of innovation communities can form a closed loop, enabling users to play a role in product design and upgrade the final effects. Therefore, the main research work of this article is to analyze the combination of factors affecting the efficiency of problem-solving in the open innovation community, identify the combination of factors contributing to the current efficiency in different situations, and put forward suggestions to improve the efficiency of problem-solving.

3. Research Design

3.1. Research Objects and Data Acquisition. This article chooses Xiaomi community as the research object. Xiaomi Company was founded in April 2010. In only 1 year, its annual income has exceeded 100 billion yuan. In the rapid rise of Xiaomi Company, its unique business model has played an important role. One year after the company was founded, Xiaomi community began to build. In the early days of its establishment, the influence of Xiaomi community was limited, but with the increase of content and functions, it began to play a role in product development, new product promotion, paid rush purchases, and other activities, and became an important bridge connecting companies, products, and users. It is a typical and successful open innovation platform. The crawler is used to crawl the post data in the Xiaomi community forum. The crawled data content includes post type, number of replies, number of approvals, number of views, time of issue creation, time of issue establishment, time of issue development, and time of issue optimization. The time of data extraction is December 2020. After preliminary integration, this article chooses to crawl the relatively complete content of notebook circle, mobile phone manager, router, Redminote88pro, network signal, cloud service, control center, super power saving, Xiaomi health, Xiaomi Bluetooth headset, and Xiaomi extreme 10 data for analysis.

3.2. Path Identification Method and Variable Setting. This article chooses the fuzzy set qualitative comparative analysis method to identify the combination of conditions that affect the efficiency of the problem being adopted and solved. At first, we introduce the process of the issue solution as shown in Figure 2.

Qualitative comparative analysis first appeared in Ragin’s book “Comparative Methods.” As a case-oriented research, this method is based on mathematical theories such as sets and Boolean algebra, and it realizes an organic combination of quantitative and directional optimal characteristics [22].

![Figure 1: The process of internet open innovation.](image-url)
Qualitative comparative analysis methods include multivalued set, clear set, and fuzzy set. According to the theory of fuzzy sets, the relationship between sets in reality is not as clear as that in the traditional set theory [23]. According to the concept of fuzzy set, the membership score of a set may be any number between 0 and 1. In a fuzzy set qualitative comparative analysis, each case is regarded as a combination of attributes [24], abandoning the net effect of a single variable, and looking at the problem from the overall perspective and configuration thinking. Different attribute combinations correspond to the results. After the users put forward questions, only a part of the issues can be adopted by the platform and put on file for settlement, and the settlement time of different issues on file is not the same. Therefore, the fuzzy set qualitative comparative analysis method is used to scientifically reveal the combination of conditions that affect the efficiency of the adoption and settlement of issues, and to deeply analyze under what circumstances the issues will be first adopted and put on file, and what are the characteristics of issues that need less time to solve. Table 1 shows the variable setting of issue adoption efficiency.

As shown in Table 1, issue adoption efficiency is measured by the time difference between question creation and project establishment as the result variable of the analysis; the antecedent variables include the number of dynamics in the circle, the number of employees stationed in the circle, the number of answer groups composed of platform users, the type of post, the number of posts, the number of approvals, and the number of views. There are two types of posts: help and suggestions. The number of posts refers to the number of posts that users reply to in the question posts that have been adopted for filing. The number of approval and the number of views, respectively, indicate the data of approval and views of the adopted issues.

As shown in Table 2, problem-solving efficiency refers to the difference between the time of question creation and the time of solution. When problem-solving efficiency is analyzed as a result variable, the adoption efficiency of the issue needs to be increased in the antecedent variables. The shorter time for the issue to be adopted, the more attention the enterprise pays to the issues, and it will inevitably give relatively more human resources and material resources to improve and solve the issue. Therefore, when we analyze the combination of conditions that affect the efficiency of the issue solution, it is necessary to consider the adoption efficiency put into the antecedent variable.

4. Data Processing

4.1. Descriptive Statistical Analysis. Before in-depth analysis of the data, in order to understand the distribution of the data, the descriptive statistical analysis is carried out first as shown in Table 3.

4.2. Data Calibration. The calibration reported below and the set relation analysis was performed using the fuzzy set/QCA 3.0 program [25]. Data calibration is to set up three critical points: complete membership point, cross membership point, and complete nonmembership point, and use fsQCA software to convert the data to 0–1. When selecting the critical point, according to the existing theory and knowledge, combined with the data and quantile points, this
articlereferstothecalibrationmethodsofWeietal.[26]and
Fiss[27],anddefines95%asthefullmembershippoint,50%
as thecrossmembershippoint,and5%asthecomplete
nonmembershippoint.

4.3.NecessityAnalysis.Sincetheposttypeofadichotomous
variable,thedatatselfisalreadybetweent0and1(Table4),
soitisnotnecessariytocalibratethedata,soitcanbeused
directly[28].

Afterdatalocalization,thedatatypeneedtobechekedfor
necessity.Ifanaecessaryconditionappearsintheantecedent
variable,theparsimonioussolutionobtainedbysoftware
processingdatawilleliminatenecessarycondition,butt onlywhentheconditionappearsintheconditioncombi-
nation,theresultwilloccur.Therefore,thenecessityof
checkingvariablesisaneffectivestep.Generallyspeaking,
iftheconsistencyisgreaterthan0.9,itisconsideredasan
ecessarycondition.

4.3.1.NecessityAnalysisofAdoptingEfficiencyasanAnte-
cedentVariable.AsshowninTable5,fortheresultsofthe
necessityofadoptionefficiency,itisfoundthattheconsis-
tencyofposttypeisashighas0.97,whichindicatesthat
the typeof help or suggestion has a significant impact on
whetherthetopicisadopted.Therefore,itisnecessaryto
eliminatenecessaryconditionofposttypesinthesubsequent
data processing.

4.3.2.NecessityAnalysisofSolutionEfficiencyasanAnte-
cedentVariable. As shown in Table 6, for the results of
thenecessityofsolutionefficiency,itisfoundthattheconsis-
tencyofposttypesisashighas0.98,whichindicatesthat
whetherthepostisahelporsuggestiontypeofalsohasa
significantimpactonwhethertheissueisimplemented.

Therefore,itisnecessarytoeliminatetheposttypeinthesubsequentdataprocessing.

4.4. Sufficiency Analysis. Sufficiency analysis is needed after
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ditionanalysis,configurationanalysisattemptstorevealso
thesufficiencyanalysisoftheresultscausedbydifferentcon-
figurationscomposedofmultipleconditions[29],thatis,to
discussthroughwhichthesetcomposedofmultipleantecedent
conditionsisasetoftheresultset.Thesameasthenec-
sessitytestisthatitisnecessarytoestablishaminimumcon-
sistencythresholdtocheckthesufficiency.Themin-
mumrecommendedthresholdofconsistencyis0.75.Thepre-
viousarticlesonthequalitativecomparisonofFuzzySets
setdifferentthresholdsforconsistency,ZhangMingsetsthe
thresholdvalueto0.76;Zhaosetsthethresholdvalueto0.75;
andZhangWeigousetsthethresholdvalueto0.8.After
theanalysisofthetestthreshold,0.85issellectedasthecon-
sistencythreshold,andthecasethresholdissettoreach
[28,30,31].

Throughthec qualitativecomparativeanalysisoffuzzysets,
wcangettheparsimonioussolution,intermediatesolution,
andcomplexsolution.Theaparsimonioussolutionincludes
tollthelogicalremainder,butsidesthinkwhetherthelogical
remainderisreasonable,sotheparsimonioussolutionoften
deviatesfromthefact;thecomplexsolutiondoesnotinclude
anynologicalremainder,onlyobservesthesolutionformedby
thecasedata;andtheintermediatesolutionincludesthetheoretical
remainderwhichisinlinewiththeexpectationoftheethe-
terialdirectionandverifiedevidence.Somarticleschoosedifferent
solutionstos analyzetheresults.WanandWangchose
toanalyzethecomplexsolutions;Zhangreportedtheinter-
mediate solutions supplemented by the simplified solutions;
WenandFiss[27,28]choosetoadanalyzeintermediate
solutions.Duetola rge numberofpaths, inorder to better

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Mean</th>
<th>Std</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of dynamics in the circle</td>
<td>27038</td>
<td>1591.72</td>
<td>1132</td>
<td>84000</td>
</tr>
<tr>
<td>The number of employees stationed in the circle</td>
<td>38</td>
<td>3.01</td>
<td>11</td>
<td>135</td>
</tr>
<tr>
<td>The number of answer groups composed of platform users</td>
<td>74</td>
<td>3.30</td>
<td>17</td>
<td>155</td>
</tr>
<tr>
<td>The number of posts</td>
<td>81</td>
<td>14.39</td>
<td>1</td>
<td>1334</td>
</tr>
<tr>
<td>The number of approvals</td>
<td>29</td>
<td>18.92</td>
<td>0</td>
<td>3933</td>
</tr>
<tr>
<td>The number of views</td>
<td>189</td>
<td>22.00</td>
<td>1</td>
<td>1560</td>
</tr>
<tr>
<td>Issue adoption efficiency</td>
<td>19</td>
<td>2.96</td>
<td>0</td>
<td>327</td>
</tr>
<tr>
<td>Issue solution efficiency</td>
<td>31</td>
<td>3.55</td>
<td>0</td>
<td>332</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Complete</th>
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<tbody>
<tr>
<td>The number of dynamics in the circle</td>
<td>1132</td>
<td>20000</td>
<td>63000</td>
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<tr>
<td>The number of employees stationed in the circle</td>
<td>11</td>
<td>17</td>
<td>135</td>
</tr>
<tr>
<td>The number of answer groups composed of platform users</td>
<td>17</td>
<td>79</td>
<td>155</td>
</tr>
<tr>
<td>The number of posts</td>
<td>1</td>
<td>8</td>
<td>541.4</td>
</tr>
<tr>
<td>The number of approvals</td>
<td>0</td>
<td>2</td>
<td>42.6</td>
</tr>
<tr>
<td>The number of views</td>
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<td>48</td>
<td>941.6</td>
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<td>Issue adoption efficiency</td>
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<td>4</td>
<td>114.4</td>
</tr>
<tr>
<td>Issue solution efficiency</td>
<td>1</td>
<td>11</td>
<td>139.8</td>
</tr>
</tbody>
</table>
analyze the characteristics of each path and the relationship between paths, we choose to interpret only the intermediate solution.

4.4.1. Sufficiency Analysis of Adopting Efficiency as an Antecedent Variable. As shown in Table 7, for the sufficiency analysis [32–38], the abbreviation of the variable will be used below. We use DY (dynamics) to replace the number of dynamics in the circle, use ES (employees stationed) to replace the number of employees stationed in the circle, use GOA (group of answer) to replace the number of answer groups composed of platform users, use PO (posts) to replace the number of posts, use AP (approval) to replace the number of approval, and use VI (views) to replace the number of views.

Since the variables of dynamic, employees stationed, and answer group are platform-level variables, and the variables of post number, the number of approval, and views are issue-level variables, different paths can be classified and analyzed according to the level of function. It can be seen from the Table 7 that the overall consistency of the obtained path is 0.834, which is greater than the set threshold, indicating that the antecedent condition of the corresponding case composition is the sufficient condition for the occurrence of issue adoption. The overall coverage rate of the path is 0.785, which shows that the results of this article can explain 78.5% of the cases.

There are only two ways to act through the issue level. Among them, the core function is the number of views and posts, which measures the user’s attention to the problem. Even if the platform variable does not play a significant role, the more likely the problem will be adopted as long as there are enough customers who pay attention to the issue and the number of views on the topic reaches a certain scale. If the general and significant defects of the products cause a lot of attention, the possibility of the issue being adopted will increase.

There are two paths that work through the platform level. The core variable in the first path is the answer group, and the core variable combination in the second path is dynamic and employees stationed. From the comparison of the two
paths, it can be concluded that when the issue-level variables do not play a role, the interpretation group variables and dynamics, and the variable combinations of employees stationed can replace each other to improve the efficiency of topic adoption. This path is suitable for companies that already have obvious improvement directions and optimization plans for their products, and file a case after a small number of customers have put forward optimization requirements for a product at the same time, it promotes the platform to pay attention to the problem and take optimization actions.

4.4.2. Sufficiency Analysis of Solution Efficiency as an Antecedent Variable. Table 8 shows the results of the sufficiency analysis [39–45] when the solution efficiency is taken as an antecedent variable. Using the same classification method, the results are divided into three categories. It can be seen from Table 7 that the overall consistency of the obtained path is 0.859, which is greater than the set threshold, indicating that the antecedent conditions of the corresponding case composition are sufficient conditions for the occurrence of issue adoption. The overall coverage rate of the path is 0.735, which shows that the results of this article can explain 73.5% of the cases.

Among the six paths at the issue level, the core variable combinations of the two paths with higher coverage are adoption efficiency, the number of posts, and the number of views. This path describes that the enterprise itself has the intention of optimization. After a large number of customers have clear optimization requirements for a product at the same time, it promotes the platform to pay attention to the problem and take optimization actions.
and the number of views. At the same time, the adoption variable appears three times, the number of views appears three times, the number of approval appears two times, and the number of posts appears two times in these six paths. From the summary of the characteristics of the path: whether the topic is adopted or not is the key to whether the problem can be solved. Therefore, the company pays attention to the issue, and the issues that are filed will definitely respond later; meanwhile, the characteristics of path variables are the same as those in the adoption stage, and the number of views and posts are high-frequency variables, which indicates that the attention of a large number of users not only improves the enterprise’s attention from the beginning of the problem establishment, but also promotes the platform interaction. In the process of problem-solving, continuous attention can also supervise the efficiency of enterprise problem-solving. This path corresponds to the implementation of the problem that has been filed by the enterprise and has a large number of views.

In one path at the platform level, dynamic and employees stationed are its core variables, which play a significant role in promoting the implementation of issues. However, the coverage rate of this path is relatively low, indicating that most of the problems in reality cannot be solved by platform alone.

There are seven paths formed under the dual effects of platforms and issue, and the number is slightly more than the first type. At this level, the highest frequency of platform variables is the answer group, which refers to the group of question-answering users in the circle. The larger the size of the answer group, the more likely the problem is to be solved. The second highest frequency variable is dynamic, which refers to the active state of users in the circle. A circle with more dynamics indicates to a certain extent that the number of users who use the product and follow the product is large. The variables that appear more frequently in the issue level are the number of approval and the number of posts. Users can convey clear modification opinions through posting or expressing opinions. Therefore, this group of paths describes the situation that has been concerned by a large number of users, and the problems that have put forward clear opinions or have been concerned by a large number of users, and in the circle where the questions are located, the larger scale of the answer group are executed more efficiently.

4.5. Robustness Test. Robustness testing can be done from two perspectives: set theory and statistical theory. From the perspective of set theory, the robustness test is realized by changing the calibration threshold and increasing or decreasing variables; from the perspective of statistical theory, the robustness test is realized by changing the data time span and other methods. In this article, the robustness test is carried out from the perspective of set theory. After changing the threshold of the adequacy test to 0.86, the path is basically consistent, which proves that the results are robust.

5. Research Conclusions and Prospects

5.1. Research Conclusion. By collecting various data on posts in the Xiaomi community, the fuzzy set qualitative comparative analysis method is used to identify the combination of conditions that affect the efficiency of issue adoption and solution.

First of all, in the necessary analysis, the consistency of post type is as high as 0.97, which is the necessity index. So, we need to delete this variable in the sufficiency analysis. In this article, when processing the data, the assignment of the post type for help is 1, and the suggested assignment is 0. Usually, when users have found that the product has problems hindering their use, the help-seeking type of post appears and users will seek help from enterprises through the platform. While the suggestion type of post is often that the product itself does not have problems hindering the use, and users hope to get a better sense of use by improving a certain aspect of the product for more convenient use. When the product is improved, it is generally updated on the basis of the normal use of the product, so the help type post will have higher efficiency in adoption and implementation than the suggestion type post.

Secondly, from the path analysis of adoption efficiency and solution efficiency, we can see that the most common path is the combination of platform-level variables and issue-level variables. This shows that in the whole process from the emergence of problems to the solution, what we need is the cooperation of the platform and the users. Only when the users actively raise problems and the platform actively cooperates to deal with problems, can we more effectively promote the problem solution. We can find that there are two paths through the issue level, two paths of the platform level, and six paths of the platforms and issue level when adoption efficiency is an antecedent variable. There are six paths through the issue level, one path of platform level, and seven paths for the two-layer interaction of issues and platforms when solution efficiency is an antecedent variable. From the adoption stage to the solution stage, the number of paths through the role of the issue-level increases significantly, and a single issue level variable as the core variable can become a path of the solution stage, which indicates that the fluctuation of the issue-level variable can significantly affect the process of the issue implementation.

Thirdly, in general, the coverage of paths with fewer core variables is higher than that with more core variables. The greater the number of core variables, the higher the requirements for corresponding cases, and the fewer cases corresponding to them.

5.2. Shortcomings and Prospects. In this article, the data obtained from the Xiaomi community is limited. At present, the data only includes the platform level and the issue level. If we can increase the personal information data of platform users and the related data of different circles, we can establish a more reasonable structure. We can analyze the influencing factors of problem adoption and problem solution from the three levels of platform, circle, and issue, and carry out more in-depth research. If we can get more relevant data about the appropriateness of problem solution methods, we can also study the combination of variables to promote the generating of high appropriateness solutions.
Data Availability
The dataset can be accessed upon request.

Conflicts of Interest
The authors declare that they have no conflicts of interest.

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