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Study on consumer behaviors and influencing factors of the IPTV audience in rural areas-- based on a survey from the perspective of the farmers in the ningxia hui autonomous region of china

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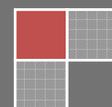
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ABSTRACT

Rural informatization must take the way of low cost, strong practicability and localization. Based on the micro-data of 358 farmers' questionnaire from 44 villages in Ningxia province, this paper measures and evaluates the present status of IPTV consumption and the influence factors, finding that the farmers have a certain perception in IPTV but the application environment has not been formed. IPTV in rural area have large prospect but the cost is too high to promote quickly. It might be effective by increasing farmers' income and making the content of IPTV more local and practical to increase farmers' willing to use IPTV.

KEYWORDS

IPTV; Consuming behavior; Influence factor; Rural area.



INTRODUCTION

The Three Networks Convergence (the integration on applications of the telecommunications network, cable network and Internet network) and the first batch of experimental cities selected for the pilot project of the Three Networks Convergence were announced by The State Council of China in June, 2010, which means the Three Networks Convergence in China has entered the stage of implementation officially. Rural Informatization is an important way for building a New Socialist Countryside, balancing urban and rural development and changing the dual structure in urban and rural economy. Because of the complex geography and the dispersed population, the construction of Rural Informatization in China needs to be taken by low cost, high practicality and localization. The Three Networks Convergence makes it possible for this way of the Rural Informatization construction. As a model in Chinese Rural Informatization construction, IPTV in rural areas of the Ningxia Hui Autonomous Region (China) in 2007 was developed to a netting twine can enable to use the telecommunications network, cable network and Internet network simultaneously for residents, making the broadband as the multi-service platform. IPTV, or Web TV, is delivered multimedia services to subscribers such as Video On Demand (VOD), Interactive TV(ITV), listening to the music and information inquiry; it is a system through television services are delivered across an access the ADSL, Ethernet or cable networks to broadband networks that employs the internet protocol(IP protocol) to transport the television signals, using domestic television set or computers as the terminal electrical equipment. As the statistic of media streaming network indicated that the IPTV users in China has reached 4.7 million(except for Hong Kong, Taiwan) until the end of December, 2009, will reach 9 million in 2010.

As a new media, IPTV has caused worldwide concern of researchers; the present study of IPTV has mainly concentrated on its development status, the trend, IPTV industrial chain, business models, IPTV consumption influencing factors, IPTV consumer behavior. The research object of IPTV in urban residents is given priority to, for little rural residents' research. Chen Xi analyzed the application prospect of IPTV in 2009, considered that the break-through point for the rural IPTV project may be found by fully utilizing the rural information to meet the requirements of Rural Informatization, not thinking in ways of the conventional consumption mode for entertainment. About the present situation of the application of IPTV in the countryside, consumer behavior and influencing factors were not reported.

This paper discusses the consumer psychology, consuming behavior and consumer satisfaction of the emerging media IPTV by the questionnaires of Ningxia farmers, shows the consumption status and influencing factors of the IPTV households, and provides the accurate information to popularize IPTV in rural areas and scientific basis for the policy making of government departments.

DATA SOURCES AND BASIC STATISTICAL ANALYSIS

Data sources

This paper uses the data coming from the Ningxia questionnaire in October 2010, including 422 questionnaires from 44 villages of the Wu Zhong, Qing tong, Ling Wu, Gu yuan and Shi zui shan cities, and 358 of the effective sample size by eliminating the key variable lack sample.

Basic statistical analysis

The basic information about the farmer survey

Farmers participating in this questionnaire, who tend to be predominantly male, accounted for 78.35%; in terms of age structure, farmers between the 30-50 years old accounted for 73.82%; in the family population scale, a family of four was in the majority, accounted for 40.63%.

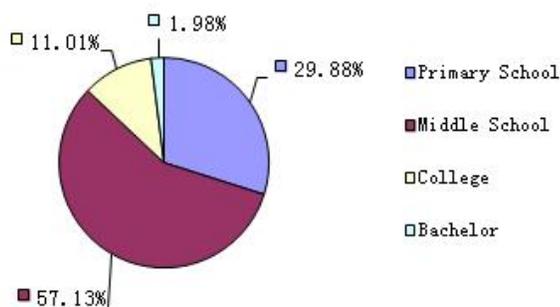


Diagram 1. Farmers' Cultural Quality

The cultural quality of farmers in this survey was generally low, 57.13% was the junior middle school education, 29.88% was the elementary school, 11.01% was the junior college education, and 1.98% was the undergraduate.

In terms of the farmers' income, annual household income was generally not high: the income less than 10,000 Yuan accounted for 3.63%; 10000-30000 accounted for 58.78%; 30000-50000 accounted for 27.63%; 50000-80000 accounted for 6.91 %; more than 80000, accounted for 3.04 %.

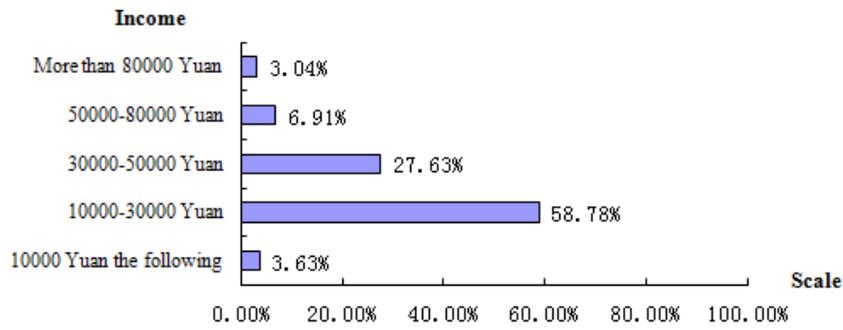


Diagram 2 Annual Income of Rural Households

Farmer family information infrastructure situation

From the TV purchase and service condition, one TV households accounted for the majority, up to 89.13%, including mainly 30 to 40 sets channels.

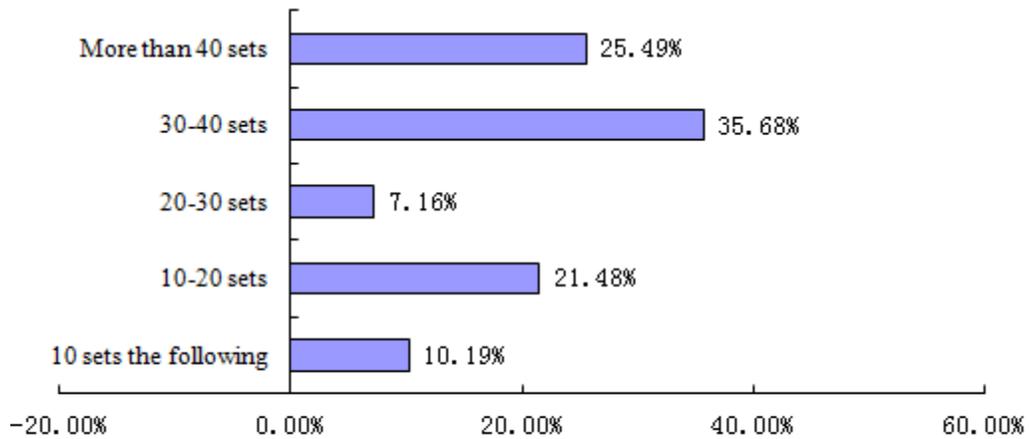


Diagram 3 Acceptable Channel

From the service condition of communications equipment, farmer subscribers of landline telephone reached 67.28%, the mobile phone owning rate reached 92.33%, almost each household has at least one mobile phone, 70.11% chose China Mobile. Number of farmers who didn't set up any computer at home accounted for 77.00%, and one computer farmers accounted for 20.14%.

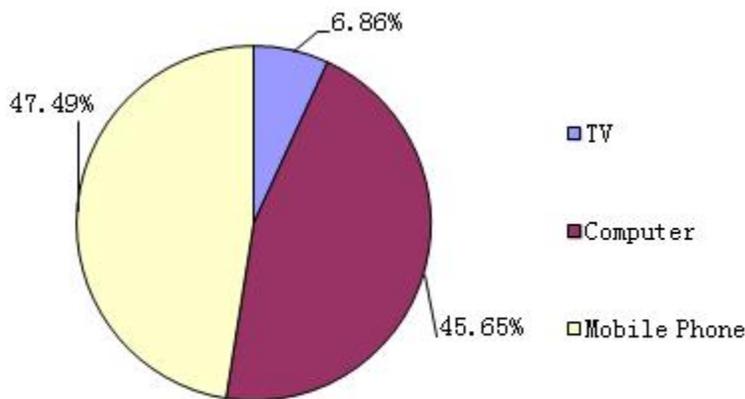


Diagram 4 Family Internet Equipment

Farm household mainly used computers and mobile phones as the network facilitates, accounting for 45.65% and 47.49% respectively. Internet connection was mainly broadband, accounting for 66.76% for entertainment and information.

About the reasons of no network, no broadband in the village reached 10.54% of the farmers, high cost was up to 42.66% of farmers, 33.51% of them thought it was unnecessary.

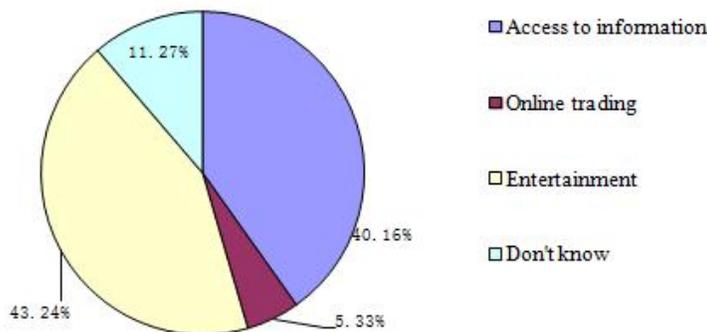


Diagram 5 Internet Use

The expenditure of informatization facilities included telephone, TV and the Internet, 17.84% of which spent 50 Yuan, 41.49% of which spent 50-100 Yuan, and 31.76% of which spent 100-300 Yuan.

IPTV CONSUMER BEHAVIOR ANALYSIS IN RURAL AREAS

Present Situation of IPTV application

Only 8.54% of the farmers in the survey installed IPTV. 7.41% was subsidized by the government, whose average subsidies reached 146 Yuan. The farmers monthly spent 10-30 Yuan on IPTV, accounting for 61.54%, and only 5.78% of the farmers opened the paid programs.

In terms of the average time of the users for watching IPTV, 33.33% of the users spent more than 9 hours every day, followed by 1-3 hours (26.32%), 6-9 hours (21.05%) and 3-6 hours (19.30%). Most of the IPTV subscribers watched IPTV every day from 21:00 to 12:00, accounting for 54.59%.

In terms of the main reasons for the installation of IPTV, half of the farmers because of a great number of programs and abundant content, following reasons are respectively: the affordable price(15.07%), additional functions such as the Internet and telephoning(14.71%), interaction(10.29%), recommendation(6.99%) and following others (2.94%). The top three of hot programs are the popular TV drama (24.72%), television news programs (22.78%), and life information programs (18.26%).

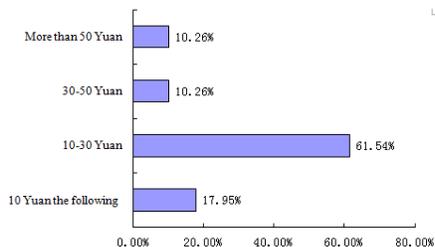


Diagram 6 Monthly cost after opening IPTV

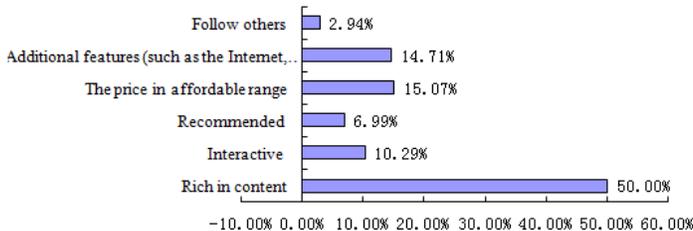


Diagram 7 The main reasons for the installation of IPTV

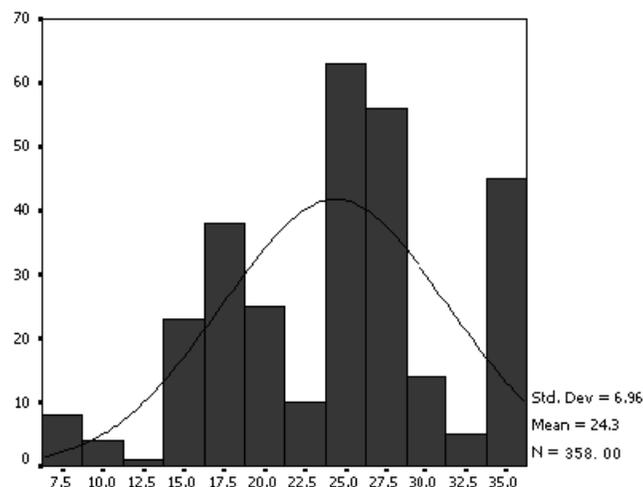
Awareness of farmers on IPTV:

The questionnaire uses the Likert Scale to measure and evaluate. Likert Scale was proposed by the American social psychologist R. A. Likert in 1932, which is the most widely used approach of scaling responses in social surveys and psychological tests. This scale is composed by a group of problems or statements on one topic to show the respondents' attitudes, views, evaluations, or intentions. Its application usually includes five-level Likert item. We arranged "strongly disagree, disagree, neither agree nor disagree, agree and strongly agree" five answers to study the farmers' awareness on IPTV with 5-grade marking system (1-5). The higher scores mean the higher awareness of farmers on IPTV.

This questionnaire has 10 items, which references the questionnaire of the IPTV consumer behavior of urban residents by Fang Xueqin's (2008)^[8]. TABLE 1 shows the statistical result by Likert Scale, and diagram 8 is the chart of frequency distribution on the total scores. From the percentage statistics of TABLE 1, the average of each item is mainly between 3.29-3.70 on the comparison of the traditional TV and IPTV. If the standard deviation is greater than 1, the standard deviation indicates that the farmers' positive attitude on IPTV. As a result of the individual differences, most people agreed the IPTV functions of "my favorite television programs on demand at any time, watching the missing programs, no or less advertisements" while didn't pay attention to some service functions such as network functions, convenient payment. Meanwhile, the subscribers focus on providing information and entertainment rather than interactive demands.

TABLE 1: Likert Scale Statistical Results (n=358)

Compared with the traditional TV,	Totally	Disagree	General	Agreed	Completely	Mean	Standard
Have more TV programs can choose	7.06	20.55	14.11	39.88	18.40	3.42	1.20
My favorite TV shows on demand at	18.13	5.31	10.63	45.31	20.62	3.45	1.36
I like the program missed can also	8.56	5.50	17.74	46.18	22.02	3.70	1.11
Don't see or watch less advertising	5.81	11.01	17.13	45.87	20.18	3.64	1.10
Read online information, send mail,	8.18	19.18	29.87	25.47	17.30	3.27	1.17
Some reservations or banking services	4.67	22.74	22.74	32.40	17.45	3.35	1.15
Play video phone, online chat, etc are	3.77	21.07	22.33	33.33	19.50	3.44	1.13
Do you think the IPTV can offer							
Can provide individualized	4.39%	6.89%	43.89%	28.53%	16.30%	3.45	0.99
Meet my entertainment demand	4.40%	5.35%	40.88%	29.25%	20.12%	3.55	1.01
Meet my interactive demand	5.03%	20.13%	33.96%	22.96%	17.92%	3.29	1.13

**Diagram 8 Scale score frequency distribution**

The comparison between the traditional TV and IPTV in rural areas, the total scores of which are 7-35 points. In terms of the frequency distribution of the total scores, the scale average is 24.3 points and the standard deviation is 6.96, most of which are between 25--30 points in the frequency distribution. From the answers of “neither agree nor disagree”, the most get more than 21 points ($3 \times 7 = 21$) in total scores, which mean the surveyed farmers have a certain sense of awareness of IPTV.

Current status of IPTV application:

Farmers had a certain sense of awareness on IPTV, but the IPTV application environment was not formed in rural areas.

From the survey result, the farmers had a certain sense of awareness on IPTV, more concerned about its diversified information and entertainment news. However, there were not so many users in rural areas because the IPTV was still in trial operation. In this survey of the Ningxia rural areas, the village installations of IPTV were mainly used to regularly carry out the remote education training and informationization training for Communist party members with low utilization rate and seriously resources idle. IPTV's development can't be formed in a short time scale, because the application environment was not yet formed.

IPTV has a great application prospect, while the high cost causing slowly being implemented.

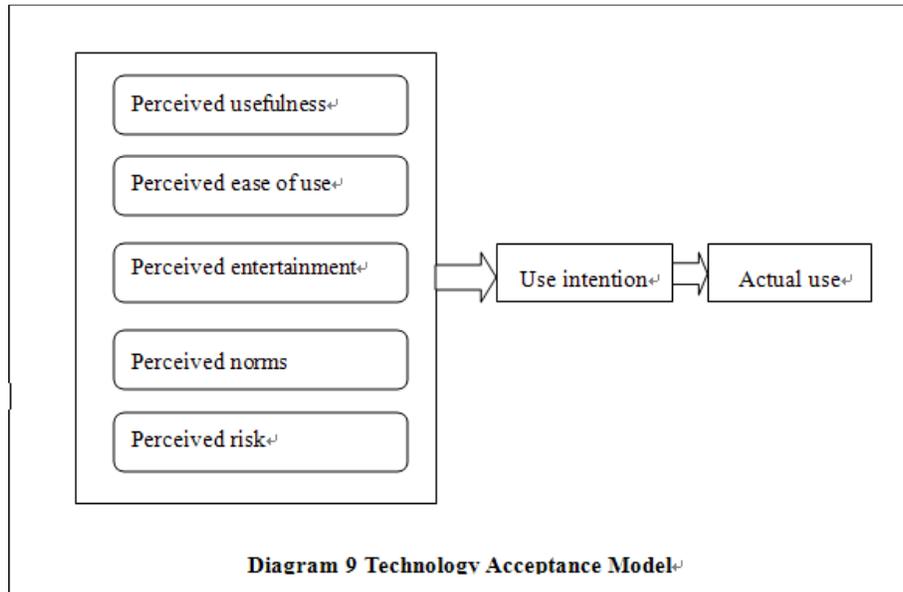
For the families with installing IPTV, half of the farmers thought that IPTV had many channels, good using effects and diverse content. Most farmers used IPTV more than three hours every day, and 54.59% of users watched in 9 PM to 12 PM. The TV series and news were popular among IPTV subscribers every day. Because the rural areas are far away from cities, farmers' demand for information is stronger. IPTV is a blend of Internet, entertainment and communication, which has a great prospect in rural areas. While farmers cannot afford the high cost of information. The survey results showed that 73.27% farmers spent more than 50 Yuan every month on Internet; moreover, the cost of fixed telephone and mobile phone is a heavy burden for them. Most of the IPTV subscribers in rural area are subsidized by the governments, few of whom opened the paid programs. Although the modern network technology develops fast, poorly educated farmers need to pay for clothing and food rather than pay the information equipment and running charges.

IPTV INFLUENCING FACTORS OF USAGE INTENTIONS

Research methods

This study uses the Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in 1975, which is an information systems theory that models how users come to accept and use it when they are presented with a new technology. The model provides a theoretical principle to find which external factors influence the users' beliefs, attitudes, intentions, and influence their decision about how and when they will use it. It was developed by worldwide scholars such as Davis, 1989^[14]; Adams, 1992^[15]; Yu, 2005. This study references a large number of documents, and selects Usage Intentions, Perception Useful, Perceived ease of use, perceived entertainment, subjective norms and perceived risk to build farmers technology acceptance model.

The model is shown below.



The research hypothesis and variable selection:

In this study, IPTV usage intention is the dependent variables. Dependent variables include: external variables (income, education), perceived usefulness, perceived ease of use, perception entertainment, subjective norms, and perceived risk.

Usage intention is consumers' subjective will to use IPTV in the future.

Perceived usefulness is user-perceived usefulness of using new technology.

Perceived ease of use is the users' perceived ease of learning to use new technology.

Perceived entertainment is the degree of pleasure felt by the user in the use of new technology.

The subjective norms refer to the popular perception of IPTV in the crowd and the perception of the public image of the individual.

The perceived risk refers to the perceived risk during consumption, such as financial risk, social risk, time risk and so on.

By the previous literature, it is known that the above factors except for the perceived risk may all have positive effect on usage intentions. Therefore, this study has the following hypothesis:

Hypothesis 1: perceived usefulness positive influences on people to the use of IPTV intention;

Hypothesis 2: perceived ease of use positive influences on people to the use of IPTV intention;

Hypothesis 3: perception entertainment positive influences on people to the use of IPTV intention;

Hypothesis 4: subjective norms positive influences on people to the use of IPTV intention;

Hypothesis 5: perceived risk negative influences on the people to the use of IPTV intention.

Model construction and parameter estimation:

This study adopts the multiple regression analysis models to analyze of the above problems. Model form as shown below:

Usage intention as $Y = f$ (per capita net income as x_1 , education background as x_2 , perception useful as x_3 , perceived ease of use as x_4 , perception entertainment x_5 , subjective norms as x_6 , and perceived risk as x_7)

This paper uses the datum in the questionnaire from 358 farmers in 44 villages of Ningxia Hui Autonomous Region, and takes SPSS 11.5 software model to estimate.

Predictors: (Constant), perceived risk, income, educational background, subjective norms, perception entertainment, perceived ease of use, perceived usefulness;

Predictors: (Constant), perceived risk, income, subjective norms, perception entertainment, perceived ease of use, perceived usefulness;

Predictors: (Constant), perceived risk, income, perception entertainment, perceived ease of use, perceived usefulness;

Predictors: (Constant), income, perception entertainment, perceived ease of use, perceived usefulness;

Dependent Variable: use intention.

According to the stepwise regression statistic result, the fourth model is the final equation, whose determination coefficient R^2 is 0.84, Goodness-of-fit. Significance test F value of the equation is 263.42, and the corresponding probability P value is less than the significance level $\alpha=0.01$. It passed the test of significance, so it can establish linear model.

The significance level $\alpha=0.01$, the corresponding probability P value is less than significant level α , which have passed the test of significance. Income, perceived usefulness, perceived ease of use, perception entertainment intention have very significant effect to IPTV use intention, and education, subjective norms, perceived risk of IPTV intention were not significant. Regression equation is:

$$Y=4.03+0.54x_1+0.37x_3+0.13x_4+0.18x_5+\mu$$

μ as random disturbance term

As a new media, whether audiences will be interested in using IPTV is the key for its promotion. The study result shows that income, perceived usefulness, perceived ease of use and perceived entertainment are four factors that have a positive impact on the farmers' willingness to use IPTV. The greatest influencing factor is income ($\beta = 0.53$), that is to say that the most effective way to increase the farmers' usage intentions is to increase income. The second factor is perceived usefulness ($\beta = 0.37$), which means the increase of IPTV useful degree and information consulting, such as the prices of farm products, inquire function of information provision, and the willingness of doing away with the traditional TVs. Perceived entertainment and perceived ease of use also have the significant impacts on IPTV usage intentions, but the influence are less than the income and perceived usefulness. IPTV is an emerging media after the integration of Internet and TV entertainment, which significantly affects the usage intentions of farmers on IPTV because it has better entertainment than the traditional TV. Besides, the convenience and easy operation also significantly affect farmers' usage intentions. From the samples of the survey, cultural qualities of the farmers are generally not high, so the easier IPTV operates; the more farmers want to use IPTV.5.

RESEARCH CONCLUSION AND SUGGESTIONS

IPTV in rural areas of the Ningxia Hui Autonomous Region(China) has been made a great contribution in Chinese Rural Informationization Construction, which was developed to a netting twine can enable to use the telecommunications network, cable network and Internet network simultaneously for residents, making the broadband as the multi-service platform; besides, it can provide the informational service for farmers such as the distance learning for communist party members, general science, lectures about agricultural knowledge, the distance learning for the middle and primary schools, tele-medicine and long-distance live video. However, IPTV is not widely used in Ningxia rural areas from the survey because of the high cost. According to the survey, the local IPTV and broadband costs 980 Yuan / year / household, which makes the IPTV application in rural areas can't be formed in a short period of time because the per capita income in rural areas is less than one-third per cent of urban residents. In addition, the IPTV content in Ningxia lacked localization and practicality though it is rich, for users would like choose the aspects related to farmers lives such employment, training and market. The TV has been a mature entertainment way to get information with easy operation in China now. The usage has been free or cheap like about more than 10 Yuan for a long time, compared with hundreds Yuan for broadband. Of course users prefer the former in rural areas.

Therefore, first of all, the high-cost problems of promotion IPTV in rural areas need to be solved. Governments should fully mobilize the enthusiasm of all social sectors to minimize the cost of the IPTV construction, making appropriate subsidies or preferential policies of experience the IPTV benefits in the beginning. When the benefits outweigh the costs, it will greatly increase farmers' usage intentions.

Secondly, the content and services of IPTV need to meet the differentiated needs of the farmers. The Interaction of IPTV makes operators to easily learn the lifestyle and personal tastes of the audiences, so the differentiation strategy can be implemented in the content and services to meet the individual needs of consumers and hold consumers' trustworthiness.

Finally, the IPTV operation should be easy, which should reference to the habits of the users in the operation on television and take the simple interface design.

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