The Analysis of Key Success Factors Affecting the Satisfaction of Agricultural Organizational Information Systems: The Mediation Role of Information Quality

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ABSTRACT

This article takes the WeChat public account of agriculture and rural areas in J Province as the research object to explore the influencing factors of satisfaction of organizational information system (IS) in agricultural sector. Firstly, new media is taken as the background, and the characteristics and communication factors of agricultural informatization are analyzed. Secondly, a user satisfaction questionnaire of the WeChat public account of agriculture and rural areas of J Province is designed based on the satisfaction theory and the success model of IS. Finally, the influencing factors of users’ satisfaction with agricultural and rural WeChat public accounts are studied through questionnaire survey. The results show that the correlation coefficients among perceived value (PV), information quality (IQ), perceived usefulness (PU), and platform satisfaction are all positive, and p £ 0.01.

KEYWORDS

Agricultural Information System, Information Quality, New Media, Satisfaction Theory, Wechat Public Account

INTRODUCTION

Research Background and Motivations

With the continuous advancement of the informatization process, informatization construction in agriculture has become an essential part of the national digital village development strategy. Improving agricultural informatization construction is an inevitable choice for promoting agricultural modernization, building beautiful villages, and boosting farmer income. It is essential in promoting
the coordinated development of urban and rural areas and realizing rural revitalization and common prosperity (Gao, 2022; Peng et al., 2022). Meanwhile, agricultural organizations in various regions have also established their information system (IS) platforms to improve production efficiency and promote economic development. However, many rural IS users are not satisfied with these systems, mainly because different users have different factors and needs when using ISs. Among them, information quality (IQ) is an essential factor in rural IS, which involves information completeness, accuracy, and timeliness. Besides this, organizational IS success has also become a hot topic in information management.

Additionally, the rapid development of electronic technology has accelerated the penetration of new media technology into various industries, bringing qualitative improvement to the development of traditional industries. With the rapid growth of science and technology, artificial intelligence (AI) presents the characteristics of extensive interdisciplinary and quick updating. AI has become a new focus of international competition (Liu & Chen, 2023). For the reality faced by different stakeholders in digital agricultural transformation, Qin et al. (2022) proposed an inclusive analysis framework based on meta-governance theory from the objectives and implications of sustainable agricultural and rural change and the interaction between the two to identify and analyze the demand, supply, participant network, and incentive mechanism in the sustainable agrarian transformation driven by digital technology and services. Steinke et al. (2021) described how user-centered design approaches could help specify problems and solutions in agricultural extension and leverage modern information and communication technologies and their role in agricultural extension. The development of agrarian modernization not only depends on the level of science and technology, bioscience research, and agricultural science and technology improvement but also needs to match the modern agrarian information and communication technology (ICT; Chen et al., 2022; Wang et al., 2022). In the year of winning the battle against poverty and promoting rural revitalization comprehensively, improving the level of agricultural information services and farmer satisfaction is important. The analysis of the critical success factors affecting the user satisfaction of agricultural organization IS can provide a reference for developing and operating agrarian IS, expand the research in agricultural information technology, and provide new perspectives and methods for this field.

**Research Objectives**

This paper takes one of the official agricultural science and technology information new media technology platforms of the Department of Agriculture and rural affairs of J Province to find out the influencing factors of farmer satisfaction with the agricultural science and technology information new media communication (NMC) platform. The users of the WeChat public account of agriculture and rural areas in J Province are the research subjects. Literature analysis and questionnaire survey are used to study the factors affecting the satisfaction of first-line farmers in J Province with the agricultural science and technology information NMC platform. The innovation of this paper lies in combining IQ with the success model of organizational IS. This paper discusses the influencing factors of rural IS user satisfaction from a comprehensive and in-depth perspective. In addition, WeChat public account is a common form of rural IS, and the user satisfaction questionnaire for WeChat public account is designed to understand the needs and concerns of rural IS users deeply. This paper can provide a theoretical reference for promoting the application of new agricultural media in agricultural information dissemination and continuously using new media technology to disseminate agrarian science and technology information.

The structural framework of this paper is divided into the following sections. First is an introduction to the research background, purpose, and significance and summarizes the innovation points through research methods. Next is a literature review that draws on the literature on existing studies and analyzes the limitations of these studies, leading to the central questions of this paper. The following section presents the research method used to comprehensively analyze the satisfaction theory and the information system success model (ISSM), used as the theoretical basis for the user
A satisfaction questionnaire on the WeChat public account of agriculture and rural areas of J Province. The next section discusses the questionnaire design and performance evaluation, analyzing the results of the questionnaire to obtain the main factors affecting user satisfaction with the public account. The conclusion summarizes the main results of the study, points out the shortcomings, and looks forward to future research directions.

**LITERATURE REVIEW**

In agricultural science and technology information dissemination, scholars have done much research. Structural changes in agriculture, new agricultural technologies, and emerging ICT have sometimes led to diversified and less costly extension and advisory services. Norton and Alwang (2020) analyzed changes in agricultural extension in this context and the impact of farmers’ adoption of virtual networks for ICT extension services. Aldosari et al. (2019) aimed to determine peasant communities’ perception of electronic media in Pakistan and the relationship between different demographic characteristics of respondents’ use of television and radio-electronic communications. A total of 183 respondents were selected using random sampling techniques, and descriptive statistics and chi-square analysis data were used. The results showed that the largest number of respondents agreed that mobile and the Internet could be useful sources of agricultural information. Nyarko and Kozári (2021) surveyed extension workers using a random sample of questionnaires to assess the use of ICT among agricultural extension workers and their impact on the delivery of extension services. Studies showed that agrarian extension workers used ICT for personal communication but not primarily for extension activities.

Aryal et al. (2020) investigated whether existing climate-smart agriculture in India could enhance climate change adaptation, mitigation, and overall food security. It was found that climate-smart agriculture could contribute substantially to climate change adaptation, ease, and food security to contribute to the design of local adaptation action plans. Chandra et al. (2018) described the role of communication technologies in disseminating agricultural information to mountain farmers in terms of farmer access to agricultural information sources, the purpose of using communication technology tools, the usefulness of information obtained through communication tools, and the shortcomings of using communication technology tools in mountain areas. It was found that the primary purpose of farmer communication tools was to obtain information on weather, farm consultation, and ruler length. Washizu and Nakano (2022) conducted a questionnaire survey on the actual situation of smart agriculture on Japanese farms, analyzed the expansion status of smart agriculture technology in Japan, and found that the production efficiency of Japanese agriculture could be improved by improving the level of data visualization and introducing smart agriculture technology.

The above research focuses on applying new agricultural technology, ICT, smart agriculture, and other emerging technologies in agrarian information dissemination, showing the great role of these emerging technologies in agriculture. However, there are few studies on satisfaction based on agricultural ISs. Therefore, the WeChat public platform of agrarian information is used as the research object to analyze the influencing factors of farmer satisfaction with such platforms.

**RESEARCH METHODOLOGY**

**Agricultural Informatization Based on New Media**

Agricultural informatization is based on information technology. It processes and analyzes various information at production, operation, management, sales, decision-making, and other stages of the agricultural industry to provide technical integration of various services. From information retrieval to technical queries and responses, from assistance in decision-making to automated regulation functions, it is aimed at a wide range of researchers, producers, and managers relevant to the agricultural industry (Xiong et al., 2020; Yang et al., 2021; Zhao et al., 2021). New media refers to a media...
carrier based on the development of information technology. Different from traditional media, such as newspapers, radio, and television, its information production, dissemination, and interaction have all the attributes and characteristics of communication in the electronic information age (Infante & Mardikaningsih, 2022; Saroj & Pal, 2020; Takahashi et al., 2020). For example, Internet+ combines various traditional industries with the Internet, hoping to stimulate the new vitality of these industries through the integration of Internet technology and traditional industries and build an increasingly broad network platform for the reform, innovation, and development of economic entities (Latif et al., 2021). Information services have gradually become an essential factor in agricultural development, and new media has been affecting the development trend of agrarian informatization construction.

There are four elements of new media agricultural science and technology information dissemination, including the organizer and publisher of the communication activity, the recipient, the quality of the content disseminated, and the retransmission process (Coman & Vodnar, 2020; Hu et al., 2020; Yin et al., 2022). Among them, the organizer and publisher of the communication activity determine the critical factors for the effective implementation of the communication activity. Recipients are groups of users with precise needs that guide the determination of communication content. The quality of the content disseminated is the basis for user retention. The retransmission process is the most essential part of the entire dissemination process. These four elements run through the process, each critical and interconnected, working together to make communication activities work. In the development of new media, WeChat is a huge existence. Since its launch in 2011, the WeChat public account has rapidly grown into the first new media platform in China (Bai et al., 2022). According to the survey data released by the China Agricultural New Media Alliance, more than 2,000 agriculture-related media are involved in planting, leisure agriculture, Internet agriculture, agricultural industrialization, and other fields and industries. Through WeChat public accounts, they play an essential role in promoting farmers to get rid of poverty and become rich, disseminating agricultural product price information, publicizing rural culture and education, promoting rural revitalization, and popularizing agrarian production technology.

**Satisfaction Theory**

The advent of globalization and the information age has intensified the competition between enterprises and organizations and increased market development. Enterprises or organizations must efficiently respond to consumer changes and market needs through targeted and differentiated services (Zhang et al., 2022). In response to market changes, Chen and Du (2022) used particle swarm optimization (PSO) algorithms to optimize deep-learning neural networks. They proposed an average distribution attenuation inertial weighted PSO. The earliest study of market demand from customer satisfaction (CS) can be traced back to the 70s of the 20th century. At that time, the study of CS gradually emerged in psychology. Then, it was introduced to marketing management and marketing. The theory of CS emphasizes that for a company to be profitable, it must satisfy customers. In 1980, Oliver established a CS cognitive model based on satisfaction, expectation, and service quality, gradually becoming an essential theoretical basis for CS research. The CS model is shown in Figure 1 (Taherdoost & Madanchian, 2021; Tuncer et al., 2021).

Figure 1 shows that when the actual effect of the actual product or service is higher than the inner expectation, CS increases, leading to happiness or smugness. Conversely, when the actual impact of the product or service is lower than the customer’s internal expectation, CS will produce feelings of dissatisfaction and show feelings of disappointment or regret. In addition, the model also considers the impact of service quality factors on CS. Quality of service includes reliability, responsiveness, assurance, compassion, and physical factors that can impact CS. Therefore, when evaluating CS, it is necessary to comprehensively consider the effect of service quality factors on CS and consider the customer’s evaluation of the actual performance of the product or service and the comparison of inner expectations. Therefore, in actual research, it is necessary to consider the impact of multiple factors on CS to obtain more accurate and comprehensive results.
ISSM

In 1992, American scholars McLean and DeLone proposed an ISSM. Based on this, the correction is carried out. The ISSM mainly includes six variables: IQ, service quality, system quality, user satisfaction (US), and organizational net income. The revised ISSM is displayed in Figure 2 (Al-Hattami, 2021). In Figure 2, IQ, service quality, and system quality are the three indicators that measure and evaluate the characteristics of ISs (Erkmen & Turegun, 2022; Sarumaha & Maksum, 2021). They can directly affect the user’s perceived usefulness (PU), thereby further intervening in the user’s attitude toward the IS during use. In conclusion, the CS model and the ISSM provide a theoretical basis for measuring farmers’ satisfaction with the agricultural science and technology information NMC platform. In addition, through the analysis of actual data, the influencing factors of the pleasure of agricultural science and technology information NMC technology platform in J Province are discussed.
Research Methods
A questionnaire was used as the primary data collection method to measure the satisfaction of farmers’ satisfaction with the WeChat public account platform of agricultural and rural areas in J Province, and the ISSM was used for data analysis. The questionnaire is a commonly used research method suitable for large-scale data collection and can quickly obtain large amounts of information. In addition, the questionnaire has the advantages of anonymity, easy operation, and low cost. However, questionnaire surveys also have disadvantages, such as easy sample bias and unreliable data quality. The reasons for choosing to use the questionnaire here are as follows. First, the questionnaire can reach more respondents, reflecting a more objective and comprehensive picture. Second, the cost of questionnaires is low, which can save research costs. Finally, the questionnaire can use statistical methods to analyze the data and obtain more accurate results.

In terms of questionnaire design, according to the ISSM, five indicators, including IQ, service quality, system quality, user satisfaction, and organizational net income, are constructed to evaluate farmers’ satisfaction with the WeChat public account of agriculture and rural areas in J Province. Besides this, some factors that may affect farmer satisfaction, such as age, gender, and education level, are included in the questionnaire as control variables. In addition to the questionnaire, in-depth interviews are conducted to obtain more detailed and comprehensive information. Various research methods, such as questionnaires and interviews, are used to obtain more accurate and complete data. The ISSM is used to analyze the data to get the satisfaction evaluation results of farmers with the agricultural science and technology information and new media exchange platform.

EXPERIMENTAL DESIGN AND PERFORMANCE EVALUATION
Experimental Materials
The study was conducted using a questionnaire. The questionnaire was divided into three parts. The first part is the basic information of the respondents, covering age, gender, and education. The second part discusses using WeChat public accounts in agricultural and rural areas, including contact time, use content, and use time. The third part includes the main factors affecting user satisfaction with the official account. The details are shown in Table 1 (Bian et al., 2021; Wang et al., 2020).

Table 1. Variable measurement affecting user satisfaction with WeChat public accounts

<table>
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<tr>
<th>Variable</th>
<th>Measurement direction</th>
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<tr>
<td>User expectations</td>
<td>• Before using the system, look forward to the system&lt;br&gt;• Hopefully, the system will play a role in diagnosis and treatment&lt;br&gt;• There are no special requirements for the system</td>
</tr>
<tr>
<td>PU</td>
<td>• Send agricultural information to users and bring convenience to users in work and life&lt;br&gt;• Respond to questions raised by users when using the official account to consult timely</td>
</tr>
<tr>
<td>IQ</td>
<td>• Timeliness&lt;br&gt;• Richness&lt;br&gt;• Accuracy&lt;br&gt;• Ease of understanding</td>
</tr>
<tr>
<td>Perceived value (PV)</td>
<td>• Basically meets the expectations of this platform&lt;br&gt;• The gains and payouts obtained using the platform are relatively equal&lt;br&gt;• After use, it improves the efficiency of agricultural work.</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>• Overall satisfied&lt;br&gt;• Get close to the agricultural information interactive platform in mind&lt;br&gt;• Exceeded expectations</td>
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The random sampling method was adopted, and the questionnaire was distributed to the users of the WeChat public account of agriculture and rural areas of J Province in the form of web survey book collection and forwarding. The questionnaire was collected, and the results were counted within the specified period. The measurement of the survey mainly used a five-point Likert scale. Respondents will be asked to choose between five options based on their personal experience using the official account. The higher the score, the more respondents agreed with the situation expressed in the question. A total of 300 questionnaires were distributed and conducted by forwarding WeChat links online. A total of 270 valid questionnaires are received, and the recovery rate is 90%, which meets the requirements of sample statistics and can be analyzed for subsequent results.

**Experimental Environment and Parameters Setting**

The statistical analysis software SPSS was used to analyze the reliability and validity of the survey data. The Cronbach’s coefficient of the overall reliability of the questionnaire was 0.961, indicating that the questionnaire confidence was high. In the Kaiser–Meyer–Olkin (KMO) test, the value of the KMO statistic was 0.935. Besides this, the significant level of the sig. value did not reach 0.001, which meets the data analysis requirements.

**Performance Evaluation**

The user situation of the WeChat public account of agriculture and rural areas in J Province was analyzed, and the results are shown in Figure 3. It shows that, among the people participating in the survey activities, 60.4% of the user group is male, much higher than that of women, indicating that men pay more attention to information about agricultural information in new media information than women. The age distribution of users is concentrated within a range of 30–60 years old, and 86.65% of the total survey number is over 30 years old. Regarding educational qualifications, junior high school education accounts for the highest proportion, at 55.9%, indicating that the group using the

![](Figure 3. Users of WeChat public accounts in agriculture and rural areas of J Province)
agricultural WeChat public account is mainly young and middle-aged people who graduated from junior high school.

In addition, the analysis of the current situation of using agricultural science and technology information NMC platform in J Province is carried out. The results of agricultural and rural WeChat public account users understanding of the length of time and daily usage time are plotted in Figure 4. In terms of time of understanding, 47.8% of the farmers understand it for a short period between half a year and one year and 38.1% of farmers have understood it for more than a year. Regarding usage time, 55.6% of farmers used it 30–60 minutes a day, accounting for the majority. 9.6% of the use time is less than 30 minutes. Only 0.4% of farmers used it for more than three hours. As a result, most farmers know and understand the agricultural and rural WeChat public account for a relatively short time, and the duration of using the agrarian WeChat public platform is also temporary. Most of them only stay on login or browsing. There is less time for the medium to help.

The main content statistics of users using the agricultural and rural WeChat public accounts are given in Figure 5. It suggests that the agricultural WeChat public platform is often used to inquire about agrarian product markets and quotations, accounting for 81.1% of the population. This is followed by understanding agricultural information, dealing with agrarian technology issues, and knowing national agricultural policy news, which accounts for 69.3%, 68.9%, and 61.5%, respectively. In addition, 35.2% of farmers have published information on agricultural products purchased on the platform. Some content, such as store opening, only accounts for 5.2%.

In addition, the background data of the agricultural WeChat public account is consulted, and the main content statistics of the tweets are shown in Figure 6. The main content of the agricultural public account is the reproduction of the public account of the superior supervisory unit, accounting for 42%. The relevant reports are mostly local agriculture-related activities and publicity work, accounting for

Figure 4. Statistics of the understanding time and usage time of users of the WeChat public account in agriculture and rural areas of J Province
38%. The dynamics of agricultural practical science and technology information are less, accounting for 20%. The reason is the platform’s lack of professional agricultural technicians and insufficient scientific research strength. The number of agrarian technicians is small, and they rarely go down to the field production line, resulting in a lack of knowledge of agricultural production. As a result, the agricultural science and technology information they lead is out of touch with farmer needs.

Subsequently, the correlation analysis among user expectations, PV, PU, IQ, and satisfaction on the WeChat public platform is demonstrated in Figure 7. Expectations refer to user hope for the WeChat public platform, including rich content, timeliness, personalized customization, and other
aspects. PV refers to the benefits and advantages that users believe can be brought about using WeChat public platforms, such as obtaining useful information and interacting with each other. PU refers to whether users acknowledge that the information and services the WeChat public platform provides meet their needs, solve their problems, or satisfy their interests. IQ is the user evaluation of the accuracy, reliability, authority, and ease of understanding of the information the WeChat public platform provides.

In Figure 7, $p < 0.01$ among PV, IQ, PU, and satisfaction indicates that the correlation between the three and satisfaction is significantly positive at 0.01, and the correlation gradually decreases. The correlation coefficient between user expectation and satisfaction is -0.519, and $p < 0.01$, indicating that the higher the user expectation, the greater the disappointment after use, and the lower the satisfaction.

Finally, PV and system satisfaction examine the relationship between IQ and PU. Figure 8 plots the results. Figure 8 reveals that the mediating effect of PU on system satisfaction through PV is 0.175, and the proportion of the mediation effect is 32.2%, which is a partial mediating effect. The mediating impact of IQ on system satisfaction through PV is 0.165, and the proportion of mediation effect is 31.3%, which is a partial mediating effect.

Discussion

In summary, the factors affecting user satisfaction with the agricultural information platform (AIP) are mainly user expectations, PV, IQ, and PU. There is a mediating effect between PU and IQ and system satisfaction. In addition, comparisons are made with other relevant studies. Kassem et al. (2021) identified factors affecting farmer satisfaction with extension services through a random sample of 393 farmers. They found that factors significantly affecting farmer satisfaction included availability, accessibility, diversity, relevance, and effectiveness of extension services. Usability and accessibility can be understood as PU and perceived ease of use. Effectiveness is relative to IQ. Therefore, the results are consistent with the conclusions of this paper, confirming the influence of IQ and PU on
the satisfaction of agricultural ISs. Kim et al. (2020) found that in the information service of AIP, the effective control of error and disturbing noise played an essential role in improving US with AIP. Therefore, to improve US with the AIP, the AIP must have high security and anti-interference to ensure the accuracy, reliability, and comprehensiveness of the information required by customers. This result is consistent with this paper’s results, indicating the role of IQ on AIP satisfaction. Lei et al. (2022) took Chinese listed companies from 2008 to 2017 as a research sample to study the relationship between accounting IQ and enterprise innovation investment efficiency in the financial industry. The results showed that accounting IQ was negatively correlated with insufficient investment and overinvestment in enterprise innovation, and accounting IQ could alleviate financing constraints and reduce the lack of innovation investment. This result is the same as the factors affecting US with the AIP. In short, more and more studies show that user expectations, PV, IQ, and PU can affect user satisfaction, and IQ plays a more critical role in user satisfaction.

CONCLUSION

This paper takes the WeChat public platform of agriculture and rural areas as the research object to study the factors affecting the satisfaction of the organizational IS of the agricultural sector. A platform satisfaction questionnaire based on satisfaction theory and ISSM is designed to analyze the influencing factors of user satisfaction with the agricultural and rural WeChat public platform. Relevant data are obtained by conducting questionnaires on the joy of agricultural science and technology information and NMC platforms among front-line farmers. The following conclusions can be drawn.

First, the age composition of farmers in the agricultural and rural WeChat public account of J Province is mainly concentrated in a range of 30–60 years old, and their education degree is mainly at the junior and senior high school level. Most users want information about agricultural development support policies and transaction prices of agricultural and sideline products. Second, through correlation analysis, the main factors affecting US with AIP are user expectation, PV, IQ, and PU.

Figure 8. Mediation test of PU and IQ

Note. *** indicates significant at the 0.001 level
Among them, user expectation and satisfaction are significantly negatively correlated. PV, IQ, PU, and satisfaction are positively correlated, and the degree of influence decreases in order. In addition, IQ and PU have a mediating effect through PV and satisfaction. Third, the main tweet content of the agricultural WeChat public account is a reprint of the public account of the superior competent unit, and the relevant reports are mostly local agriculture-related activities and publicity work.

The information dynamics of agricultural practical science and technology are less. The platform’s push of information does not combine local facts, such as recent local weather trends, local agricultural product production, and sales price trends, thereby reducing user enthusiasm for reading. However, there are some shortcomings. First, the sample size is insufficient to indicate whether the conclusions apply to other regions and industries. Future studies can expand the sample size, thereby enhancing the breadth of research conclusions and broadening the scope of the application of research conclusions. In addition, the study on the factors influencing the satisfaction of agricultural technology information new media communication platforms in this paper overlooks the continuous government use. However, with the rapid development of new media technology, many governments have completed the optimization and reconstruction of internal frameworks and workflows through the Internet. Through learning and using the latest new media information technology, they have brought all-round, multi-level, transparent, and standardized quality services and management to society. Therefore, studying the satisfaction and influencing factors of the intergovernmental agricultural science and technology information new media dissemination platform is also an important research direction in the future.

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