



Digital inclusion in social media marketing adoption: the role of product suitability in the agriculture sector

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Abstract

Information and communication technologies (ICT) are critical to leverage the digital divide among disadvantaged individuals, groups, and communities. Given the persistent urban–rural gap in technology adoption and usage, this study intends to understand factors motivating rural farmer's adoption of social media marketing (SMM) tools in China. We contextualize and extend the Unified Theory of Acceptance and Use of Technology (UTAUT) framework to China's agriculture sector. Specifically, we propose product SMM suitability as a new moderator based on the channel/product fit literature. The survey method is utilized to validate the proposed research model. Six follow-up interviews are analyzed to supplement the quantitative survey findings. While the result confirms UTAUT's generalizability in China's agriculture sector, it also demonstrates limited generational divide and gender divide in SMM adoption among Chinese farmers. More importantly, the newly proposed moderator, SMM product suitability, is empirically validated. Farmers consider non-grain products to be more suitable for SMM than grain products. SMM product suitability not only directly increases Chinese farmers' SMM adoption intention, but also moderates the relationship between behavioral intention and use as well as the relationship between facilitating conditions and use.

Keywords Social media marketing · UTAUT · Product suitability · China · Farmers · Mobile commerce

1 Introduction

Digital inclusion is critical to social stability and sustainable development. However, disparities concerning access and use of ICT effectively have long existed between individuals, households, businesses, and geographic regions (Ejemeyovwi et al. 2020; Newman et al. 2017). One such divide is the urban–rural gap, where rural

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residents significantly lag behind their urban counterparts in computer and Internet access and usage (Aker 2010; Gao et al. 2018; Jensen 2007). In a recent study, Loo and Wang (2017) examine China's e-development data from 2008–2014. They find that the urban–rural digital gap has widened over the years, even though digital disparities at the provincial level have been drastically decreased. China is recognized as a global digital superpower with the US and ranked top 4 in digital riser ranking of G20 by the World Economic Forum (2020¹). However, the urban–rural digital divide is still a reality the country needs to confront, as its 40% rural population only represents 28% of the country's Internet users² (Statista 2020).

Encouraging disadvantaged people and groups to adopt technologies is an effective way to ensure digital inclusion. To understand the urban–rural digital divide and improve inclusion of rural residents in the digital economy, this research investigates factors motivating or hindering the adoption of mobile-based social media marketing (SMM) among Chinese farmers. The agriculture sector plays a vital role in economic development in rural China (Huang and Liang 2018). SMM refers to product and service promotion and integrated marketing communications via social media platforms, such as Facebook, Twitter, and Instagram (Hoffman and Fodor 2010; Shareef et al. 2019; Tuten and Mintu-Wimsatt 2018). Since consumers increasingly rely on social media platforms for networking, entertainment, and shopping, more and more marketers consider SMM as a key channel to communicate with their target audience (Carvalho and Fernandes 2018). Effective SMM can enhance brand awareness, engagement and foster relationships and interactions with customers (Hoffman and Fodor 2010). According to the 2020 CMO survey, the percentage of companies' marketing budgets on social media has increased from 3.5% in 2009 to over 13% in 2020 (Moorman 2019). Consequently, there is a growing interest in understanding the use of SMM among practitioners and academics (Ashley and Tuten 2015; Felix et al. 2017; Stephen 2016).

WeChat is identified as the focal social media channel of our research. Among all social media platforms available in China, WeChat is the most popular messaging application (CIWTeam 2017). With an estimate of 1 billion monthly active users, WeChat offers companies various tools, such as moments advertising and local ads, to target heterogeneous consumer segments across the region. Many small and medium-sized enterprises (SMEs) can develop WeChat marketing in-house with very limited budgets (Escobedo 2019).

Mobile devices have the power to address the digital inclusion issue (Newman et al. 2017; Qureshi and Xiong 2021). Despite the widespread adoption of WeChat, farmers in rural China may not have equitable ICT resources or skills to carry out necessary digital marketing activities. For instance, Loo and Wang (2017) find that in rural areas, smartphone possession “does not necessarily bring about the smart use of them” (pp. 740). “Internet plus agriculture” has been recently identified by the Chinese government as a key to modernize its agriculture sector and revitalize its

¹ <https://www.weforum.org/agenda/2020/09/which-countries-are-leading-the-way-in-digital-competitiveness/>.

² <https://www.statista.com/statistics/265154/internet-users-in-china-in-urban-and-rural-regions/>.

rural villages.³ Internet technologies play a vital role in entrepreneurial activities in rural China, and many farmers and farm cooperatives turn to e-commerce platforms to advertise and distribute their products (Heang and Khan 2015). However, there still exists a big digital divide between urban and rural Internet users in China (Harwit 2004; Li et al. 2019). Most farmers live in rural areas, and such digital divide has created many problems restricting adoption and use of e-commerce in China's agriculture sector (Hong et al. 2017; Li et al. 2019). Thus, major e-commerce platforms in China are actively developing programs to encourage and help farmers sell their products directly via SMM (Wei 2020). Mobile devices play a critical role in increasing digital inclusion in China, especially in rural areas (Li et al. 2007; McCarthy 2018). A recent survey indicates that more than 99% of Chinese Internet users use mobile devices to access the Internet (Weissberger 2020). Thus, it is imperative to explore factors encouraging farmers' technology adoption, especially mobile-based SMM, to implement the "Internet plus agriculture" strategy. Although technology adoption research has been conducted among many types of users, studies focusing on farmers are still scarce (Venkatesh et al. 2016). Therefore, we choose to contextualize technology adoption research among China's farmers. We intend to extend the existing theory by proposing and incorporating key situational factors based on the research setting. Specifically, we propose and validate a new moderator, product suitability to SMM, based on the channel/product fit literature. Overall, the research question for this study is: *what is the role of product suitability in the agriculture sector, and how does it impact Chinese farmers' SMM adoption?*

To answer the research question, our model is primarily developed based on the well-known unified theory of acceptance and use of technology (UTAUT). We further extend the UTAUT framework by developing and validating a new moderator: product suitability to SMM. Prior literature has indicated that "product characteristics play a major role in the successfulness of its marketing on the Internet" (Kiang and Chi 2001). While product differences across major categories (e.g., books vs. food vs. apparel) have been explored in the literature (Kiang et al. 2000), there lacks fine-grained research on product heterogeneities within the same category. Thus, it is important to carefully evaluate and differentiate products belonging to the same category for the agriculture sector, since the agriculture sector includes a wide range of products differing in many aspects (Ruttan 1998). Based on the channel/product fit framework (Peterson et al. 1997), we propose to evaluate product SMM suitability based on three sub-dimensions: product heterogeneity, brand equity potential, and value-added potential. We then validate our product classifications and categorize agriculture products into low-suitability and high-suitability groups based on an exploratory pilot survey of 106 Chinese farmers.

The following primary survey is completed by 313 Chinese farmers in order to examine whether their decision to adopt WeChat marketing is affected by the types of agriculture products they produce. In-depth follow-up interviews with six selected survey participants are conducted to supplement quantitative survey data analyses. Our results confirm all direct relationships proposed in the original UTAUT theory,

³ http://english.gov.cn/premier/news/2018/06/27/content_281476200805076.htm.

suggesting the theory's generalizability in the agriculture sector. Interestingly, our results demonstrate limited generational divide and gender divide in SMM adoption among Chinese farmers. Digital inclusion is feasible if technologies have reached a sufficiently high penetration rate. In China, users are already very familiar with WeChat application due to its wide diffusion. Even traditionally disadvantaged groups, such as seniors and women, are ready to extend WeChat's personal usage into business-oriented functions. We also validate the newly proposed moderator, SMM product suitability. Results reveal that SMM product suitability directly increases Chinese farmers' SMM adoption intention. It also moderates the relationship between behavioral intention and use and the relationship between facilitating conditions and use.

The remainder of the paper is organized as follows. We first review the theoretical model and propose our hypotheses. Then we discuss our research context, data collection procedures, empirical analyses, as well as results. Finally, we summarize our research contributions, implications, as well as potential directions for future extension.

2 The research model and hypotheses

2.1 UTAUT

Our research model is developed based on the Unified Theory of Acceptance and Use of Technology (UTAUT), a well-established and widely used research framework proposed by Venkatesh et al. (2003). “According to UTAUT, performance expectancy, effort expectancy, and social influence were theorized and found to influence behavioral intention to use a technology, while behavioral intention and facilitating conditions determine technology use.” (Venkatesh et al. 2016). Furthermore, individual differences, such as age and gender, moderate the relationship between independent variables and behavior intention and technology use. In the following subsection, we first explain hypotheses developed based on UTAUT. We then propose a new moderating mechanism, product SMM suitability, based on the channel/product fit framework. We conduct an exploratory survey to operationalize and validate the newly proposed moderator in our specific research context. Our research model is illustrated in Fig. 1.

Since there is extant literature on UTAUT, we only briefly explain the key constructs proposed and validated by prior studies (Venkatesh et al. 2003; Venkatesh et al. 2016) as follows.

Behavioral Intention refers to the degree to which Chinese farmers have consciously planned to use or not use WeChat-based SMM to promote and market their agriculture products (Maruping et al. 2017). For example, they can post promotional information and conduct market campaigns via WeChat to their potential customers. Behavioral intention represents individuals’ “internally formulated behavioral commitment to perform a target behavior” (Maruping et al. 2017), and can be predicted by performance expectancy, effort expectancy, and social influence. Behavioral

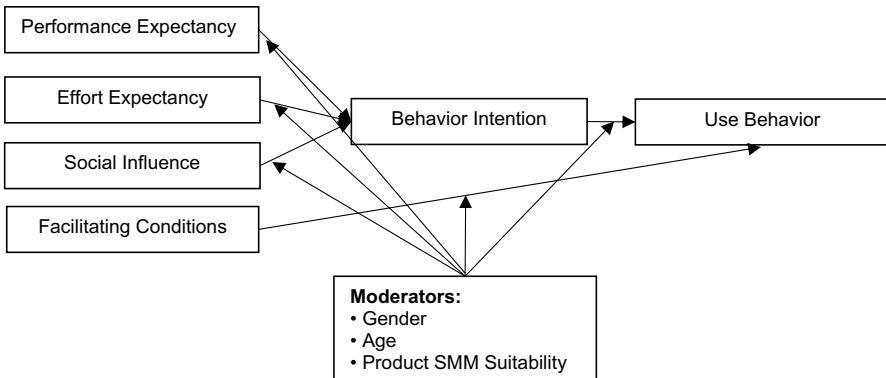


Fig. 1 The research model

Intention is in the center of the research model. The first set of hypotheses provides the foundation of the research model.

Performance Expectancy is defined as the degree to which using WeChat-based SMM will benefit Chinese farmers in promoting and selling their agriculture products to end consumers. If farmers expect to gain more benefits from conducting WeChat-based SMM, such as reaching more potential customers and selling more products directly via the WeChat-based SMM channel, they are more likely to form a stronger intention to use the tool. Farmers would be eager to adopt WeChat-base SMM tools, if they foresee business potentials in the new marketing channel. Therefore, farmer's intention to adopt WeChat-based SMM increases if they perceive more benefits from doing so (H1).

Effort Expectancy is defined as the degree of easiness to use associated with Chinese farmers' adoption of WeChat-based SMM. People will hesitate to adopt a new technology if they do not feel confident to do so. If Chinese farmers feel that it is easy to conduct WeChat-based SMM, they are more likely to give it a try. On the other hand, if farmers feel that efforts needed to conduct WeChat-based SMM is too high, they might feel intimidated, walk away from the technology, and just continue their traditional way to market their agriculture products. Thus, *farmer's intention to use WeChat-based SMM increases if they feel at ease to do so (H2)*.

Social Influence is defined as the degree to which Chinese farmers think that important others around them believe that they should use WeChat-based SMM to increase their products' market awareness. Chinese farmers live in rural villages, where relationship matters in such close-knit communities. They pay close attention to and care about important other's opinions, such as fellow farmers in the farm cooperative. If others around them feel they should conduct WeChat-based SMM, they are more likely to follow those expectations and form a strong intention to do so. Therefore, *social influence is believed to positively affect farmers' intention to adopt new information systems (H3)*.

Numerous studies have verified that behavioral intention is a prevalent factor determining individuals' technology usage (Maruping et al. 2017; Venkatesh et al.

2003). Therefore, we hypothesize that *Chinese farmers' intention to adopt WeChat-based SMM is positively associated with their actual usage (H4)*. If farmers' intention to utilize WeChat-based SMM increases, then it is more likely that they will eventually use it. The actual usage of WeChat-based SMM may include posting moments to promote products or business, sending private messages with promotional information, and sending promotional information to various WeChat groups.

Facilitating conditions are defined as the degree to which Chinese farmers believe that their adoption of WeChat-based SMM can be supported by existing organizational and technical infrastructure. Using the WeChat channel for various marketing activities requires farmers to explore and try advanced functionalities available in the mobile-based platform. Many farmers may not be familiar with all those technical features. If more support, assistance, and services available to them to facilitate their adoption efforts, they are more likely to use WeChat-based SMM. Thus, Chinese farmer's usage of WeChat-based SMM is positively associated with assistance and service resources available to them (H5).

Individual users are heterogeneous in terms of their innovativeness towards emerging technologies, and more innovative individuals are more likely to try new technologies. Prior literature has suggested that both age and gender are associated with individuals' innovativeness, and thus we incorporate them as moderators in our research model (Lee et al. 2010; Venkatesh et al. 2012). Gender and age are also two key demographic factors contributing to digital adoption disparity (Weerakkody et al. 2012). Thus we intend to examine whether SMM adoption among Chinese farmers exhibits a similar age gap as well as the gender gap.

Moderator: age. In general, younger individuals tend to be more innovative, open to change, and willing to try things they are unfamiliar with. Also, younger generations grow up with computer technologies, and they are better equipped with skills to maneuver new social media applications. Therefore, younger users are more likely to try out novel and new technologies in the early stage of their market introduction. In the context of Chinese farmers, we expect to observe a similar pattern. It might be easier to convince younger farmers to try out innovative technologies than their senior counterparts. We hypothesize that the relationships between SMM usage and its predictors are strengthened by age (H6). More specifically, the following hypotheses are proposed.

The relationship between Behavioral Intention and SMM usage is strengthened by age (H6a).

The relationship between Facilitating Conditions and SMM usage is strengthened by age (H6b).

The relationship between Performance Expectancy and SMM Behavior Intention is strengthened by age (H6c).

The relationship between Effort Expectancy and SMM Behavior Intention is strengthened by age (H6d).

The relationship between Social Influence and SMM Behavior Intention is strengthened by age (H6e).

Moderator: gender. Men and women usually exhibit different behaviors in the decision-making process. While men's decision making tends to be more independent and heuristic, women tend to pay more attention to information from others and

more detail-oriented. Consequently, women are likely to be more cautious while evaluating a new technology, and their adoption decision may lag behind their male counterparts. In the context of Chinese farmers, we expect to observe such a difference between male farmers and female farmers. It might be easier to convince male farmers to try out WeChat-based SMM tools than their female counterparts. We hypothesize that the relationships between SMM usage and its predictors are stronger for women than for men (H7). More specifically, the following hypothesizes are proposed.

The relationship between Behavioral Intention and SMM usage is stronger for women than for men (H7a).

The relationship between Facilitating Conditions and SMM usage is stronger for women than for men (H7b).

The relationship between Performance Expectancy and SMM Behavior Intention is stronger for women than for men (H7c).

The relationship between Effort Expectancy and SMM Behavior Intention is stronger for women than for men (H7d).

The relationship between Social Influence and SMM Behavior Intention is stronger for women than for men (H7e).

Control variables. We control for additional individual as well as organizational heterogeneities among our survey respondents. Specifically, we include the following control variables: an individual's educational level, an individual's WeChat experience, and the type and size of the farm the individual is working for. From a theoretical perspective, this paper contributes to the contextualized UTAUT. As Venkatesh et al. (2016) stated, in order to ensure consistency of UTAUT relationships across heterogeneous user groups, it is appropriate to include the above control variables. Additionally, one of the authors is an instructor of the farmer training program, who has years of experience in the Chinese agriculture sector. This author also concurred the importance of those control variables. In China, farmers work for different types of farming organizations, include family farms, large planters, farmers' cooperatives, as well as agriculture enterprises. We also use land acreage operated by the farm to differentiate varying organizational sizes. While the number of employees is a common measure for organizational size, it is not applicable in our research setting. The reason is that the agriculture industry's hiring practice is very seasonal. Many farms hire seasonal migrant workers during the harvest time, and their employment fluctuates significantly over time.

2.2 The new moderator: product SMM suitability

Although the UTAUT model has been extensively used in the IS field, it is important to extend the existing theory by proposing and validating new variables that reflect various research contexts. Our research intends to contribute to the theory by introducing a new moderator mechanism: product SMM suitability.

Prior e-commerce literature has discussed the importance of fit between channel features and product characteristics (Walia et al. 2016). Channel features are evaluated based on three dimensions (Kiang et al. 2000; Peterson et al. 1997). The

communication dimension focuses on information exchange between sellers and buyers, the transaction dimension centers around sales activities, and the distribution dimension concerns the physical delivery of the products. Similarly, product features are also evaluated based on three dimensions, including purchase frequency, value proposition (i.e., physical vs. informational goods), and differentiation potential (Kiang et al. 2000; Peterson et al. 1997). Based on the channel/product fit concept, we propose and operationalize a new construct, product SMM suitability, to assess the fit between a product and the innovative digital marketing channel SMM. We further hypothesize that product SMM suitability moderates the relationship between predictors and SMM usage.

In terms of the channel features, we focus on the communication dimension of the SMM channel. The SMM channel is a subset of the Internet marketing channel, where marketers directly promote their products and services to end consumers through digital platforms. WeChat has grown into a full-functional platform. WeChat shares common features of conventional Internet marketing along the transaction and distribution dimensions among those three channel dimensions. However, WeChat tends to be more personal, interactive, and engaging than the conventional Internet marketing along the communication dimension (Papasolomou and Melanthiou 2012). In the SMM channel, seller/consumer relationships are more involved and engaging, since consumers are able to form intimate connections with sellers via interpersonal ties and/or brand affiliation. Sellers usually provide more customized information to consumers via the SMM channel. For instance, sellers can easily use the WeChat application to create and maintain various chat groups to serve heterogeneous customer segments. They can decide which groups of customers can view specific WeChat moment advertisements. Sellers and consumers can also chat with each other through multimedia communications, including text, audio, and video messages. To ensure the effectiveness of their communication messages, sellers need to understand consumer preferences, individualize their promotional efforts, and engage consumers in bidirectional and interactive conversations.

In terms of the product features, we focus on the differentiation potential dimension. Our research studies the agriculture sector, where products are physical goods and can be purchased repeatedly. However, differentiation potential varies among agriculture products. SMM's dynamic and customized communication suits best with agriculture products with the potential of differentiation and customization (Kiang et al. 2000). Therefore, we define SMM suitability as the degree to which the SMM channel is beneficial to communicate a product's differentiation potential to its customers.

If a product is more suitable to SMM, it enjoys a higher probability to achieve potential benefits from its customized SMM messages. Consequently, individuals can more easily see the fit between the products and the SMM as a communication channel for promotion and customer engagement. The adoption barrier tends to be lower for products with high SMM suitability, and individuals are more likely to perform SMM without deliberately forming a strong internal intention to do so. Therefore, the relationship between behavioral intention and SMM usage will be weaker for products with higher SMM suitability than those with lower SMM suitability. Similarly, individuals are also more willing to overcome hurdles associated

with lack of infrastructure support, if their products potentially fit better with the SMM channel. If individuals are selling products highly suitable for the emerging SMM channel, they are more easily to form the intention to do so. Product SMM suitability is expected to differentiate individuals in their beliefs-intention relationships. We thus hypothesize that the relationships between SMM usage and its predictors are attenuated by product SMM suitability (H8). More specifically, the following hypotheses are proposed.

The relationship between Behavioral Intention and SMM usage is attenuated by product SMM suitability (H8a).

The relationship between Facilitating Conditions and SMM usage is attenuated by product SMM suitability (H8b).

The relationship between Performance Expectancy and SMM Behavior Intention is attenuated by product SMM suitability (H8c).

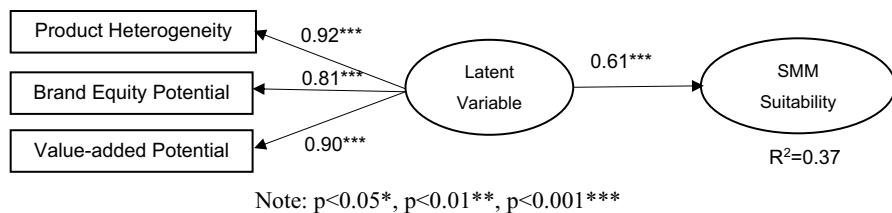
The relationship between Effort Expectancy and SMM Behavior Intention is attenuated by product SMM suitability (H8d).

The relationship between Social Influence and SMM Behavior Intention is attenuated by product SMM suitability (H8e).

3 Method

3.1 SMM operationalization

Since we hypothesize product SMM suitability as a moderator in the UTAUT framework, we need to operationalize this construct to systematically evaluate products, especially for products belonging to the same category. The SMM channel enables sellers to create and deliver personalized and customized information to consumers, thus working well in situations where product differentiation is easy and worthwhile. We propose that product SMM suitability can be determined by three sub-dimensions: product heterogeneity, brand equity potential, and value-added potential (Kiang et al. 2000). It is easier for customers to differentiate products offered by various sellers, if those products are heterogeneous in various aspects. Sellers can differentiate themselves from rivals by establishing their brand equity so that customers may associate the brand with the product during the purchase process (Keller 1993; Wu et al. 2019). Customers tend to pay close attention to marketing messages conveyed by their familiar and favorite brands. Last but not least, marketing literature suggests that high value-added products offer retailers more opportunities of differentiation through establishing their own brands (Huang and Huddleston 2009). To empirically validate and implement our proposed method to evaluate and classify agriculture products based on their SMM suitability, we conducted a simple exploratory survey among 106 Chinese farmers. We asked survey respondents to assess their agricultural products in terms of product heterogeneity, brand equity potential, value-added potential, and SMM suitability, which were measured by a single question on 1–7 Likert scale. Figure 2 shows the structural equation modeling (SEM) results, which support our proposed evaluation of product SMM suitability based on those three sub-dimensions. The latent reflective variable, measured by product

**Fig. 2** SMM suitability concept**Table 1** Agriculture product categorization based on SMM suitability

	SMM suitability	Product heterogeneity	Brand equity potential	Value-added potential
Grain ($n=65$)	4.38	4.54	4.91	4.83
Non-grain ($n=41$)	5.14	4.83	5.32	5.49
Two sample t test	**	n.s	n.s	*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

heterogeneity, brand equity potential, and value-added potential, can explain 37% variance of product SMM suitability.

Our study focuses on farmers who can potentially engage in direct marketing and/or product sales via social media platforms. Those farmers produce a wide range of products, such as grain, fruits, and vegetables. Based on the pilot survey results as well as inputs from experts in the Chinese agriculture market, we classify those products into two categories: grain vs. non-grain. In our study, the two categories are mutually exclusive and collectively exhaustive. The grain category refers to products like wheat, rice, oats, or other grain products. The non-grain category refers to products including fruits, vegetables, flowers, poultry, livestock, and seafood. Table 1 provides summary statistics for those two groups based on the aforementioned survey. It is evident that the non-grain category has more product heterogeneities, and enjoys more brand equity potential and value-added potential. Therefore, the grain category represents products with low SMM suitability, while the non-grain category represents products with high SMM suitability. In the following section, we conduct the main survey to test the moderating effect of SMM suitability, and examine whether factors motivating farmer's adoption of SMM vary across those two product categories.

3.2 Research context and data collection

We follow the literature and adopt the survey method to validate our proposed research model. After the exploratory survey of 106 Chinese farmers to classify agriculture products based on their SMM suitability, a follow-up paper-based survey was administered between Jul 2017 and May 2018 in Jiangsu Province, China. The participants of the survey were Professional Farmer Training Program (PFTP)

trainees, who were all professional farmers. The PFTP is sponsored by the local government to support and serve family farmers, large planters, farmer's cooperatives and agricultural leading enterprises engaging in modern agricultural production, management, and innovation. The training program intends to cover all eligible farming businesses in the Jiangsu Province in five years, and thus its participants are representative of our survey target population. Training participants produce different agricultural products, including rice, wheat, fruits and vegetables, and poultry products. The training content covers agricultural production and management, agricultural product quality and safety, agricultural product marketing, modern agricultural entrepreneurship, etc. One of the co-authors is an instructor of the PFTP program, who distributed survey questionnaires to all program participants during the data collection period at the end of the training section. We distributed 500 questionnaires and received 380 responses, representing a 76% response rate. Several rounds of data cleaning were conducted. First, all missing data were marked for future analysis. Second, each returned questionnaire was manually reviewed, and data quality was ensured by removing straight-liners and pattern responses. Thirdly, missing data imputation was used if the percentage of missing observations was small. After data cleansing, 313 usable surveys are included in the analysis.

The following table provides detailed demographic characteristics of the survey respondents.

3.3 Measurement model

The survey contains three separate parts. The first part collects demographic information of survey participants, including gender, age, and education. The second part covers variables developed based on the UTAUT model, including Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Condition (FC), Behavioral Intention (BI), and Use Behavior (USE). The last part of the survey includes main product (MainProduct) that the farm produces, and the survey respondent's familiarity with WeChat, measured by the time they have used the mobile-based application, the survey respondent's farm organizational type, as well as the acreage their farm operates. Table 2 summarizes demographic characteristics of survey respondents covered in the first and third part of the survey.

Our sample is representative since it covered major product categories in the agriculture industry in China. Moreover, there is a good balance between survey respondents with different ages, genders, as well as the main products that their farm produces. According to the World Bank data, 22% of the employment in agriculture in China comes from females in 2020. Thus, our survey result matches with the data from the World Bank.⁴ We utilized the seven-point Likert scale to measure the UTAUT related constructs. Other variables, include MainProduct, WeChat, Age, and Gender, are measured as categorical variables. In order to validate both the measurement model as well as the structural model, we have conducted the

⁴ <https://data.worldbank.org/indicator/SL.AGR.EMPL.FE.ZS>.

Table 2 Demographic characteristics of the respondents ($N=313$)

Gender	Female = 73 (23.32%); Male = 224 (71.57%); N/A = 16 (5.11%)
Age	20–29 = 13 (5.11%); 30–30 = 33 (10.54%); 40–49 = 96 (30.67%); 50–59 = 73 (23.32%); ≥ 60 = 7 (2.24%); N/A = 2 (0.64%)
Education	Elementary school = 10 (3.19%); Middle school = 105 (33.55%); High school = 134 (42.81%); College = 50 (15.97%); Postgraduate = 1 (0.32%); N/A = 13 (4.15%)
WeChat experiences	Less than 6 months = 11 (3.51%); 6 months–1 year = 18 (5.75%); 1–2 years = 50 (15.97%); More than 2 years = 209 (66.77%); Never = 8 (2.56%); N/A = 17 (5.43%)
Organizational type	Family/Individual Farms = 238 (76.04%); Lager plantation = 55 (17.57%); N/A = 20 (6.39%)
Land acreage (Unit: Mu, 1 Mu = 666.7 m ²)	0–50 Mu = 27 (8.63%); 51–100 Mu = 12 (3.83%); 101–150 Mu = 45 (14.38%); 151–200 Mu = 35 (11.18%); 201–300 Mu = 41 (13.10%); 301–400 Mu = 21 (6.71%); 401–1000 Mu = 19 (6.07%); Greater than 1000 Mu = 20 (6.39%); N/A = 93 (29.71%)

following tests. Validated items in prior UTAUT research are utilized and translated into Chinese (see Appendix), and correlation analysis, reliability, and confirmatory factor analysis are performed using SEM. We also test the common method bias for the survey data. In addition, we supplement quantitative data analyses with follow-up interviews with selected survey participants.

3.4 Instrument validation

The research utilizes Partial Least Squares (PLS) based SEM to conduct model analysis and validation (Benitez et al. 2020). There are several reasons for that. First, SEM-based study has become increasingly popular during the past 10 years (Shiau and Sarstedt 2019; Urbach and Ahlemann 2010). Second, our model includes three different moderators and model complexity does not limit the usage of PLS-based analysis (Diamantopoulos 2011; Wetzel et al. 2009). Third, PLS is robust against small sample sizes and violated multivariate normality assumption (Diamantopoulos 2011).

We conducted a 1500 bootstrap sampling approach to evaluate the reliability, convergent validity and discriminant validity of the measurement model. Table 3 provides information about the reliability, validity, and descriptive statistics information. Based on the results from Table 3, composite reliability (CR) for all constructs are above 0.7 threshold value. Meanwhile, the Average Variance Extracted (AVE) for all constructs are above 0.5 threshold. They indicate a good reliability for the sample data (Fornell and Larcker 1981). Cronbach's Alpha values for all constructs are above 0.8, indicating that all items have a relatively high internal consistency (Tavakol and Dennick 2011).

Table 4 provides information about factor loadings and cross loadings information. All items except EE1 are well above 0.7 threshold value. Low

Table 3 Reliability, validity and descriptive statistics

Constructs	Average variance extracted (AVE)	Composite reliability (CR)	Alpha	Items	Mean	Standard deviation
Performance expectancy (PE)	0.668	0.909	0.876	PE1	6.064	0.847
				PE2	6.032	0.952
				PE3	6.166	0.826
				PE4	5.997	0.959
				PE5	6.173	0.871
Effort expectancy (EE)	0.580	0.872	0.813	EE1	6.01	0.866
				EE2	5.151	1.649
				EE3	5.283	1.484
				EE4	5.576	1.195
				EE5	5.782	1.057
Social influence (SI)	0.671	0.891	0.836	SI1	5.334	1.353
				SI2	5.5	1.118
				SI3	5.55	1.15
				SI4	5.773	1.011
Behavior intention (BI)	0.827	0.935	0.896	BI1	5.302	1.158
				BI2	5.267	1.113
				BI3	5.466	1.08
Facilitating conditions (FC)	0.661	0.886	0.83	FC1	5.463	1.166
				FC2	5.577	1.047
				FC3	5.49	1.149
				FC4	5.687	1.115
Use behavior (USE)	0.820	0.932	0.891	USE1	4.236	1.749
				USE2	3.838	1.752
				USE3	3.984	1.827

cross-loadings on unrelated constructs can be observed, indicating excellent convergent and discriminant validity (Fornell and Larcker 1981).

Table 5 provides information about the assessment of discriminant validity by using Fornell-Larcker Criterion. The square root of the AVE, which is bold in the diagonal direction, is above the construct correlations in both rows and columns. This further supports the discriminant validity of the constructs (Fornell and Larcker 1981).

To further validate the results, common method bias (CMB) can be detected by using Harman's singer factor (Podsakoff et al. 2003; Liang et al. 2007). Results from the test suggest that 24 factors are presented and the most covariance that can be explained by one factor is 12.01%. It is much lower than 50%, suggesting that CMB is less likely to contaminate the results (Liang et al. 2007; Podsakoff et al. 2003).

Table 4 Factor loadings and cross loadings

	BI	EE	FC	PE	SI	USE
BI1	0.897	0.375	0.491	0.333	0.448	0.456
BI2	0.928	0.385	0.487	0.337	0.435	0.496
BI3	0.903	0.363	0.525	0.355	0.461	0.464
EE1	0.287	0.568	0.363	0.476	0.506	0.211
EE2	0.274	0.779	0.384	0.283	0.428	0.250
EE3	0.284	0.830	0.422	0.372	0.425	0.250
EE4	0.325	0.815	0.411	0.286	0.419	0.224
EE5	0.369	0.785	0.463	0.512	0.529	0.248
FC1	0.465	0.447	0.752	0.400	0.580	0.324
FC2	0.461	0.365	0.855	0.332	0.471	0.373
FC3	0.460	0.529	0.871	0.406	0.508	0.493
FC4	0.412	0.408	0.767	0.293	0.465	0.308
PE1	0.340	0.498	0.423	0.793	0.486	0.275
PE2	0.227	0.412	0.352	0.769	0.418	0.210
PE3	0.279	0.392	0.377	0.845	0.447	0.239
PE4	0.315	0.361	0.308	0.832	0.423	0.212
PE5	0.346	0.435	0.349	0.844	0.492	0.206
SI1	0.367	0.484	0.466	0.434	0.803	0.331
SI2	0.467	0.544	0.536	0.491	0.866	0.428
SI3	0.407	0.519	0.529	0.462	0.845	0.356
SI4	0.362	0.453	0.487	0.437	0.760	0.319
Use1	0.515	0.342	0.482	0.354	0.447	0.903
Use2	0.477	0.243	0.376	0.179	0.386	0.907
Use3	0.409	0.253	0.421	0.209	0.356	0.906

Factor loadings are shown in bold

Table 5 Assessment of discriminant validity

Age	BI	EE	FC	Gender	product SMM suit-ability	PE	SI	USE	
Age	1.000								
BI	0.010	0.910							
EE	0.082	0.411	0.761						
FC	0.098	0.550	0.543	0.813					
Gender	0.136	– 0.064	0.026	0.044	1.000				
Suitability	– 0.047	0.159	0.081	0.087	– 0.091	1.000			
PE	0.016	0.376	0.516	0.443	0.011	0.170	0.817		
SI	0.068	0.493	0.612	0.617	– 0.046	0.099	0.558	0.819	
USE	0.105	0.519	0.312	0.474	– 0.024	0.033	0.279	0.441	0.906

Items in bold represent the square root of the AVE scores

Table 6 Results of hypotheses testing

	Coefficients	Standard deviation	T statistics	p values	Hypothesis	Results
PE-> BI	0.11	0.054	2.038	0.04**	H1	Supported
EE-> BI	0.137	0.071	1.935	0.05**	H2	Supported
SI—> BI	0.375	0.068	5.49	0***	H3	Supported
BI—> USE	0.348	0.053	6.545	0***	H4	Supported
FC—> USE	0.302	0.049	6.116	0***	H5	Supported
Age—> BI	0.007	0.054	0.137	0.89		
Age—> USE	0.102	0.053	1.909	0.057*		
Age*BI—> USE	0.135	0.064	2.09	0.037**	H6a	Supported
Age*FC—> USE	0.028	0.059	0.474	0.636	H6b	Not Supported
Age*PE—> BI	-0.04	0.056	0.707	0.48	H6c	Not Supported
Age*EE—> BI	-0.079	0.068	1.158	0.247	H6d	Not Supported
Age*SI—> BI	0.056	0.062	0.9	0.369	H6e	Not Supported
Gender—> BI	-0.045	0.048	0.931	0.352		
Gender—> USE	-0.052	0.051	1.008	0.314		
Gender*BI—> USE	0.094	0.07	1.338	0.181	H7a	Not Supported
Gender*FC—> USE	0.003	0.06	0.043	0.966	H7b	Not Supported
Gender*PE—> BI	0.086	0.062	1.387	0.166	H7c	Not Supported
Gender*EE—> BI	0.083	0.075	1.113	0.266	H7d	Not Supported
Gender*SI—> BI	-0.152	0.069	2.225	0.027**	H7e	Supported
Product SMM Suitability-> BI	0.086	0.052	1.652	0.099*		
Product SMM Suitability—> USE	-0.041	0.046	0.885	0.377		
Product SMM Suitability*BI—> USE	-0.1	0.056	1.791	0.074*	H8a	Supported
Product SMM Suitability*FC—> USE	0.12	0.056	2.138	0.033**	H8b	Supported
Product SMM Suitability*PE—> BI	0.077	0.055	1.409	0.159	H8c	Not Supported
Product SMM Suitability*EE—> BI	-0.044	0.067	0.653	0.514	H8d	Not Supported
Product SMM Suitability*SI—> BI	-0.057	0.07	0.812	0.417	H8e	Not Supported

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

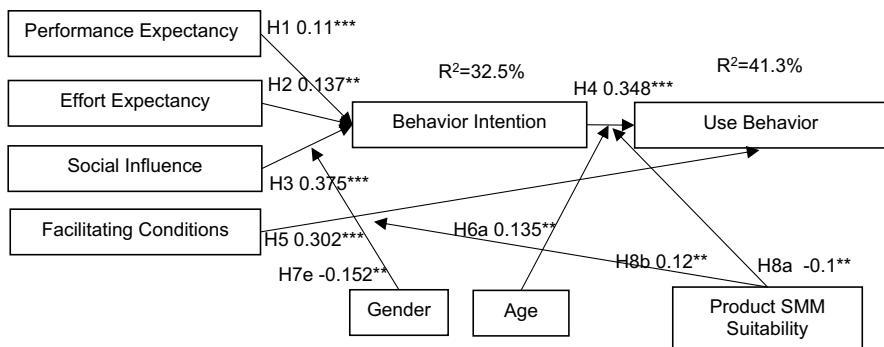
3.5 Hypotheses testing

Hypotheses testing was conducted after instrument validation, and Table 6 provides information about the results.

Based on the detailed results reported in Table 6, hypotheses H1 to H5 are all supported. Specifically, the results indicate that Chinese farmer's intention to adopt

Table 7 Profiles of interviewees

ID	Location in Jiangsu	Organization type	Main products
CZ	Changzhou	Co-op	River Crab
YZ	Yangzhou	Co-op	Giant River Prawn
WX	Wuxi	Family farm	Dragon Fruit
XZ	Xuzhou	Family farm	Apple
SZ	Suzhou	Family farm	Rice
UD	Undisclosed	Family farm	Crayfish



*p<0.1; **p<0.05; ***p<0.01

Fig. 3 Results

WeChat-based SMM is positively and significantly associated with performance expectancy, effort expectancy, and social influence. Furthermore, behavioral intention and facilitating conditions positively and significantly affect Chinese farmer's actual usage of WeChat-based SMM. Those five hypotheses are direct applications of the original UTAUT framework, confirming that UTAUT can be applied in China's agriculture sector (Venkatesh and Zhang 2010). Among the three predictors of behavioral intention, social influence has the largest coefficient ($b=0.375^{***}$), further suggesting the importance of social relationships in promoting e-commerce tools like WeChat in rural China (Martinsons 2008) Table 7.

H6 to H8 focus on moderators that differentiate technology adoption and use across various user subgroups and include the newly proposed moderator, product SMM suitability. Moderating effects are tested by using the two-stage methods. Hypothesis 6 hypothesizes that the relationships between SMM usage and its predictors are strengthened by age and is supported partially. The results show that age positively moderates the relationship between behavioral intention and use, while all other hypothesized moderating effects are statistically insignificant.

Hypothesis 7 suggests that the relationships between SMM usage and its predictors are stronger for women than for men, and is supported partially. Based on the results, gender is only statistically significant in moderating the effect of social influence towards behavior intention. According to our research, female farmer's

intention to adopt WeChat-based SMM is more likely to be formed from social influence than male farmers.

Finally, Hypothesis 8 proposes that the relationships between SMM usage and its predictors are attenuated by product SMM suitability, and is partially supported. Product SMM Suitability is statistically significant in moderating the effect of behavior intention and facilitating conditions with the actual usage of the WeChat based SMM.

We summarize all statistically significant results in Fig. 3. Overall, the model explains 32.5% of the variance for Behavior Intention and 41.3% of the variance for Use Behavior. All UTAUT-originated factors are positively and significantly related to the dependent variables, including behavior intention and use behavior. All control variables, including an individual's educational level, an individual's WeChat experience, and the type and size of the farm the individual is working for are not statistically significant.

3.6 The mediating effect of behavior intention

The research further tests the mediating effect of behavior intention. According to Baron and Kenny (1986) and Zhao et al. (2010), BI's mediation effects towards use behavior is statistically significant. The total indirect effects for Performance Expectancy, Effort Expectancy, and Social Influence towards Use Behavior is 0.038, 0.047, and 0.131. For one standard deviation increase of Performance Expectancy, we predict a 0.038 increase in Use Behavior via Behavior Intention. For one standard deviation increase of Effort Expectancy, we predict a 0.047 increase in Use Behavior via Behavior Intention. For one standard deviation increase of Social Influence, we predict a 0.131 increase in Use Behavior via Behavior Intention. As the bootstrapping 95% confidence interval does not contain zero, the indirect effect is statistically significant. Thus, Behavior Intention has a mediating effect in our model.

3.7 Follow-up interviews and qualitative data analyses

Follow-up interviews with randomly selected survey participants were conducted in Dec 2018 to further validate our research findings. In total, we did six in-depth interviews with farmers from different cities in the Jiangsu Province. Those farmers represented two organization types, family farms, and farm co-operatives, and produced a wide range of products. The following table provides information about the interviewees. We followed literature to systematically code and analyze the qualitative data (Eisenhardt and Graebner 2007). Each interview lasted 30 min on average. The sample size for the follow-up interviews was small, and we mainly used the qualitative data to supplement our findings from the main survey.

Table 8 provides questions asked to each interviewee.

Based on the answers from six interviewees, we are able to transcribe and analyze them by pattern matching (Yin 2017). Both within-case analysis and cross-case analysis were utilized as the literature suggests (Eisenhardt and Graebner 2007;

ID	Concepts	Questions
1	Audience and channel	How do you use WeChat-based social media marketing to promote and sell your products (e.g., group chat/moment/others)? Who are your target audience?
2	Suitability	Do you think that WeChat-based social media marketing is suitable to your products? Why?
3	Challenges	What are challenges you have faced when using WeChat-based social media marketing?
4	Benefits	What are benefits you have received when using WeChat-based social media marketing?
5	Support	What types of support to you would like to receive to better utilize WeChat-based social media marketing?
6	Social influence	Do you know others who use WeChat-based social media marketing? Are you influenced by their adoption decisions?
7	Alternatives	Do you have other alternative ways to promote your products? Online and/or offline

Table 9 Coding template for qualitative data analysis

Subjects	Audience and channel	Suitability	Challenges	Benefits	Support	Social influence	Alternatives
CZ	Acquaintance on WeChat	N/A	Trust; Over marketing; Logistics cost; Quality control	Better customer relationship management	Technical support in information and logistics	Fierce competition; Copyright issues	Online marketplace; Wholesalers
YZ	Word of mouth; Brand creation	N/A	Hard to find customers; Quality control	N/A	N/A	N/A	Wholesalers; Restaurant chains
WX	Team collaboration; Moments ad; Use the official brand account	Very suitable	Lack of IT skills to manage account	Low cost and low entry barriers; fast dissemination	Technical support	Competitor	Wholesalers
XZ	Acquaintance on WeChat	Very suitable	Lack of e-commerce knowledge	Convenience; Low cost	Technical support for the App	Competition	Wholesalers
SZ	Existing clients	Fair	New customer acquisition	N/A	To improve own marketing skills	Create an eco-system with other WeChat marketers	Wholesalers
UD	Acquaintance on WeChat	Not very suitable in terms of logistics	Quality control of fresh products	Product promotion	N/A	N/A	Restaurant chains; Direct sales in the community

Miles et al. 1994; Yin 2009; Yin 2017). Table 9 provides a coding template for our qualitative data analysis.

Interview data indicate that Chinese farmers use WeChat as a complementary marketing channel to promote their products to existing as well as new customers. Consistent with survey findings, interview data further confirm the importance of performance expectancy, effort expectancy, social influence, and facilitating conditions. Farmers using WeChat-based SMM can articulate benefits received from the innovative digital promotional channel. At the same time, they also express concerns towards their technical competence and hope to receive more technical support and services from Tencent to maintain their WeChat SMM activities.

Based on the qualitative analysis, many farmers indicate the importance of maintaining relationship, or Guanxi, in the Chinese market (Davison and Ou 2008; Ou et al. 2014). For example, SZ highlights the importance of maintaining relationships with customers online. YZ, XZ, and CZ identify the power of word of mouth. This further suggests the significant importance of social influence towards usage of WeChat based SMM. Interviewees also feel the pressure to use WeChat SMM after observing their competitors' adoption decisions. Interestingly, one interviewee has explicitly expressed positive social influence from other WeChat SMM adopters:

“I can work with other WeChat marketers to promote our products jointly. In this way, we can share resources and establish a larger marketing platform for various participants and products.” XZ

Among our interviewees, two non-grain farmers indicate that WeChat SMM is very suitable to their products, while the only grain farmer thinks the suitability of the WeChat channel is only fair. Although one non-grain farmer suggests issues with WeChat channel, the challenge is primarily related to logistics, instead of product promotion and marketing. In sum, the follow-up interviews and qualitative data analyses further help validate our proposed research model.

4 Discussion

China has entered a new era for digital and mobile innovations (Tyfield and Zuev 2018; Zhong and Nieminen 2015). Our research applies and extends UTAUT framework to understand Chinese farmers' decision to use SMM to directly promote agriculture products to end consumers. Mobile technologies play a crucial role in promoting digital inclusion in China, and mobile-based applications, such as WeChat, greatly facilitate access to and use of digital innovations in rural China. We examine factors encouraging farmer's adoption of WeChat-based SMM, and our research contributes to bridge the urban–rural digital gap.

4.1 Contributions and implications

Our research has made contributions to several areas of technology adoption research. First, our research focuses on an important digital innovation in a

developing country, mobile-based SMM. Our results demonstrate applicability of UTAUT in the agriculture sector. We contextualize the UTAUT model in China's agriculture sector, and confirm the generalizability of UTAUT in diverse research contexts. All direct relationships (e.g., PEBI, EEBI, SIBI, BIUSE, FCUSE) are positive and statistically significant, just as UTAUT has suggested. Not surprisingly, social influence is the most influential factor that encourages Chinese farmers to form adoption intention of WeChat-based SMM. SMM is implemented via social media platforms, where relationships with external others, such as family members, friends, colleagues, suppliers, and customers, represent valuable resources embedded in such technical infrastructure. Compared to internal evaluation of expected benefits and efforts, individuals place greater weights on views from those external referents while formulating their behavioral commitment to SMM.

Second, we show that individual differences, including both age and gender, only play limited moderating roles in determining Chinese farmer's SMM adoption intention and use. Age only positively moderates the relationship between behavioral intention and use, while all other hypothesized moderating effects are statistically insignificant. It confirms prior literature that older people tend to be more cautious when moving from technology adoption intention to actual usage. Similarly, gender only negatively moderates the relationship between social influence and behavioral intention, while all other hypothesize moderating effects are statistically insignificant. The result, consistent with prior literature, suggests that men are less likely to be affected by external referents than women when forming their technology adoption intention. We attribute the overall limited generational divide and gender divide to the wide diffusion of the underlying technology WeChat. WeChat is a well-known and well-adopted mobile application in China. Chinese people use WeChat for social networking, shopping, paying utilities, money transfer, reading, and many other activities. Since majority of individual users are already familiar with WeChat, digital inclusion of traditionally disadvantaged groups, such as seniors and women, become quite feasible.

Surprisingly, our result suggests that older farmers tend to use more WeChat-based SMM. We offer several possible explanations for this seemingly counterintuitive result. One possibility is that WeChat's high penetration rate in China helps to break down the traditional age barrier, as we have explained before. Also, social media market is highly fragmented in China. While WeChat is the dominating social media mobile application, there are many other alternatives, such as Douyin and Kuaishou, in the China market. It is possible that younger farmers are more tech-savvy than older ones, and they may experiment some other alternative social media applications for SMM. Consequently, their usage and reliance of WeChat-based SMM are lower than their older counterparts.

Third, we propose a new moderator, product SMM suitability, based on the channel/product fit literature as well as special features of SMM as a communication channel. We emphasize and empirically validate the importance to consider the fit between product characteristics and channel features. Our research also suggests that subtle differences exist even within the same broad product category. Furthermore, we provide a useful and practical framework to systematically evaluate product

SMM suitability based on three dimensions, including product heterogeneity, brand equity potential, and value-added potential.

Our results demonstrate that product SMM suitability affects Chinese farmers' SMM adoption and use both directly and indirectly as a moderator. If a product is more suitable to the SMM channel, individuals are more motivated to form stronger intention to adopt such digital innovation. Furthermore, SMM suitability also weakens the relationship between behavioral intention and use. Based on the research results, it is suggested that Chinese farmers are more likely to move from potential commitment to actual usage if they are producing and selling highly suitable products.

It is worth noting that the relationship between facilitating conditions and use is strengthened by product SMM suitability, which is contrary to our hypothesis. The result suggests that Chinese farmer's SMM use relies more on facilitating conditions for more suitable products. According to our study, products with high SMM suitability tend to be more heterogeneous and incorporate more value-added features. Thus, those products are more complicated and difficulty to describe. For instance, a farmer may spend more time and effort to accurately illustrate and explain non-grain products, such as flowers, vegetables, and poultry, than grain products, such as wheat, rice and corn. To accurately depict product differences and value-added features, farmers probably need to use more images, audio and video clips to present their products via WeChat channels. While products with higher SMM suitability can better realize potential benefits from customized and interactive communications with customers, they also require more technical capabilities to handle such sophisticated media usage. Consequently, products with higher SMM suitability rely more on facilitating conditions to encourage SMM usage. Our follow-up interviews also provide additional evidence. We interviewed five non-grain farms and one grain farm. The grain farmer does not name any technical support she/he expects to receive from Tencent. At the same time, three non-grain farmers express their desire to receive more technical supports from Tencent, including informational technical supports, logistical aid, monitoring functions, identity verification, and backend sales assistance.

There are several practical implications from the research. First, during the recent COVID-19 pandemic, it becomes obvious that SMM can significantly benefit Chinese farmers without access to other marketing channels. With the ongoing pushes of the Internet Plus Agriculture policy and the Chinese government's efforts to alleviate poverty in less developed regions and in modernizing agriculture in more developed regions, there are promising opportunities for SMM. Potentially, it can be combined and intergraded with video-sharing platforms to utilize its power further. Additionally, digital inclusion during the process can further reduce economic inequalities (Zaffar et al. 2019). For practitioners and policymakers, encouraging SMM adoption among farmers brings economic opportunities to rural China and reduces the urban–rural digital divide. Findings from our research suggest several ways to facilitate the digital inclusion of rural farmers. For instance, policymakers may first target non-grain farmers to initiate SMM usage in rural areas. Government agencies and policymakers should work closely with platform operators to provide necessary technical support to farmers. Then those initial successful use cases can

create positive social influence, further promote SMM adoption to grain farmers, and enhance digital inclusion in rural China.

4.2 Limitations and future research directions

Our research identifies factors encouraging Chinese farmers to adopt SMM, as well as how these motivational factors vary based on individual user characteristics as well as product characteristics. There are several limitations in our research that need to be considered and extended in future research. First, our sample size of the follow-up interviews is relatively small. It may be helpful to include more qualitative data from interviews and case studies to provide deep understanding in the future. Second, our survey collected data from farmers located in one province in China through the government-sponsored training program. It is important to extend and compare our results to farmer's SMM adoption and use in other regions, especially less developed provinces in China as well as other developing countries. Third, we only investigate factors motivating farmer's SMM adoption and use. Future studies can explore social and economic impacts of SMM use among Chinese farmers. It is important to understand whether and how SMM can bring economic opportunities and prosperities to Chinese farmers and help reduce digital divide between rural and urban areas. Additionally, we only apply and validate product suitability concept in a single industry, the agriculture industry. Our proposed definition of SMM suitability is generic. However, the operationalization of the SMM suitability construct might need to be extended and validated in other sectors, such as personal financial services, digital content products, and online education products. Additional product features, such as physical vs. digital goods, should be carefully evaluated.

Appendix A: Survey instruments and items

Construct	Item
Performance expectancy (PE)	I believe that using WeChat marketing could be useful for... My business Relationship development or maintenance Market awareness Market penetration Product sales
Effort expectancy (EE)	I believe that, in the context of WeChat marketing, My interaction with WeChat is clear and understandable Using WeChat marketing does not require a lot of mental effort It is easy for me to use WeChat marketing Learning to use WeChat marketing is easy for me It would be easy for me to become skillful at using WeChat Marketing

Construct	Item
Social influence (SI)	In the context of marketing... People who influence my decisions think that I should use WeChat marketing In general, people in my business has supported the use of WeChat marketing People who are important to me think that I should use WeChat marketing The senior management of this business has been helpful in the use of WeChat marketing
Facilitating conditions (FC)	I have the resources necessary to use WeChat marketing I have the knowledge necessary to use WeChat marketing Using WeChat marketing is entirely within my control Assistance with technical difficulties is available
Behavioral intention (BI)	I intend to use WeChat for marketing and promotion in the next three months I predict that I would use WeChat marketing in the next three months I plan to use WeChat marketing in the next three months
Technology use (USE)	How often do you engage in the following activities on WeChat? (1. Never, 2. Rarely, 3. Sometimes, 4. Often, 5. Very Frequently) Post moments to promote products or business Send private messages with promotional information Send promotional information to various WeChat groups

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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