

EXAMINING THE EFFECT OF AGILE PROJECT MANAGEMENT ON ALIGNING THE CHARACTERISTICS TRAITS OF E-COMMERCE LIVE BROADCAST ANCHORS WITH CONSUMER LOYALTY

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ABSTRACT: Purpose: This study seeks to examine the impact of agile project management on consumer loyalty within the agricultural sector in China. This study specifically examines the mediating role of personality traits of e-commerce live broadcast anchors in this relationship. Method: Data were obtained from a sample of 329 consumers in the agricultural sector in China. The analysis utilized Partial Least Squares Structural Equation Modelling (PLS-SEM). This study examined the effects of agile project management on consumer loyalty and its influence on the personality traits of e-commerce live broadcast anchors. Findings: The study findings suggest that agile project management has a significant impact on consumer loyalty and the personality traits of e-commerce live broadcast anchors. Moreover, the study revealed that the personality traits of anchors play a crucial role in mediating the connection between agile project management and consumer loyalty. Implications: The findings have important implications for agricultural project management and the role of e-commerce live broadcast anchors. This study emphasizes the significance of agile project management practices in improving customer loyalty and underscores the value of developing certain personality traits among anchors in the e-commerce sector to enhance this impact. These insights can provide guidance to businesses and organizations in optimizing their strategies for customer engagement and loyalty in the digital age.

Keywords: Agile Project Management, Consumer Loyalty, Personality Traits, E-commerce, Live Broadcast Anchors, Software Consumption.

1. Introduction

The digital realm is facilitating the evolution of contemporary business. E-commerce has transformed business-consumer interactions in the current dynamic environment (Zhao et al., 2020). Live broadcasts have gained popularity in this region as a means of real-time customer engagement and viewer connection (Deng, Benckendorff, & Wang, 2021). These anchors, who are frequently the representatives of e-commerce platforms, possess considerable power in shaping customer perceptions and behaviours (Xiao, Ni, & Wang, 2023). This study examines the interrelationships between Agile project management practices, anchor personality traits, and customer loyalty in the agricultural e-commerce sector in China. This study aims to explore the connections between variables to gain a better understanding of the factors that contribute to customer loyalty in the digital age. The findings of this research can provide valuable insights for businesses operating in this dynamic environment.

Agile project management has gained popularity in various industries due to its ability to adapt to changing market conditions and client requirements (Kaim, Härting, & Reichstein, 2019). The approach is characterized by its iterative nature and focus on customer needs. Agile methods can significantly influence consumer experiences and their loyalty to

digital platforms in the e-commerce context (Yawised et al., 2022). The personalities of e-commerce live broadcast anchors play a crucial role simultaneously (Xiao et al., 2023). Zhao et al. (2020) argue that anchors can establish emotional connections with viewers, leading to increased customer loyalty. This is achieved through relatability, trustworthiness, and engagement. This study examines the effects of Agile project management practices on anchor personality traits and customer loyalty, aiming to understand the complex relationships among these three factors.

This study is built upon a substantial body of empirical research in relevant fields. Previous research has extensively explored the importance of customer loyalty in maintaining the viability of businesses (Zhao et al., 2020). Agile project management is recognized as a driver for improving customer satisfaction and responsiveness (Hadjinicolaou, Dumrak, & Mostafa, 2020). Research on consumer behaviour has highlighted the significance of anchor personalities in establishing emotional connections and fostering trust (Zhang, Zhang, & Wang, 2022). The current research aims to address gaps in our understanding by examining the interrelationships among variables in agricultural e-commerce in China, building upon empirical findings that provide a strong foundation (Zhou et al., 2021). This study is supported by empirical evidence from

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established findings in related fields and the identification of a significant gap in the current literature (Zhang et al., 2022). The initial foundation of empirical grounding is established through research on Agile project management practices. Research indicates that Agile methodologies greatly improve customer satisfaction through the promotion of collaborative, adaptable, and customer-centric approaches. Agile methods can significantly influence consumer experiences and their loyalty to digital platforms in the e-commerce context (Hadjinicolaou et al., 2020). The principles align with Agile's core tenets of iterative development and continuous customer feedback. This forms the basis for examining how Agile project management impacts customer loyalty in e-commerce.

Consumer behaviour research provides important empirical support for the role of anchor personalities in influencing emotional connections and trust (Zhou et al., 2021). The personality traits of anchors in e-commerce live broadcasts have a substantial impact on viewer engagement and loyalty (Jing, Mass, & Anita, 2023; Xiao et al., 2023). These empirical findings support our decision to study anchor personality traits as an important factor that influences the connection between Agile project management and customer loyalty (Kaim et al., 2019). Furthermore, the existing literature on customer loyalty, which has been a longstanding area of focus, provides additional support to the empirical background (Reichheld & Sasser, 1990). Customer loyalty is crucial for business profitability and reflects a brand's ability to engage and retain its customers (Hadjinicolaou et al., 2020). These empirical findings highlight the importance of customer loyalty as a key variable in our study, confirming its significance as an outcome variable that represents the core of customer-business relationships (Zhang et al., 2023). The empirical support for this study is based on a multidimensional foundation that incorporates established findings from Agile project management, consumer behaviour, and customer loyalty literature (Abbas et al., 2023; Deng et al., 2021). This research aims to explore the complex connections between Agile project management, anchor personality traits, and customer loyalty in the context of agricultural e-commerce in China. By examining these relationships, this study aims to enhance our empirical understanding of these interconnections.

This study utilises relationship marketing theory, which suggests that trust, commitment, and satisfaction are key factors in establishing long-term customer relationships (Gaur, Kingshott, & Sharma, 2019). The theory emphasises the significance of comprehending

customer needs and cultivating emotional bonds. Anchors play a crucial role as intermediaries in the relationship between e-commerce live broadcasts and customers, influencing their perceptions and loyalty (Deng et al., 2021). Relationship marketing theory offers a theoretical framework for examining the interconnectedness between Agile project management practices, anchor personality traits, and customer loyalty (Tamer Hamdy et al., 2022; Wisker, 2020). Based on the aforementioned, this research has two primary objectives. This study aims to examine the effects of Agile project management on anchor personality traits and customer loyalty in the agricultural e-commerce industry in China. Additionally, this study seeks to investigate the role of anchor personality traits in moderating the association between Agile project management and customer loyalty. This study aims to provide valuable insights for businesses in the agricultural e-commerce sector, helping them develop effective strategies and practices for digital marketing and customer engagement.

2. Literature Review

Flexible approaches have become more prevalent in the project management industry over time, replacing rigid ones (Gaur et al., 2019). Agile project management has gained significant adoption due to its effectiveness in managing complex and dynamic projects (Hadjinicolaou et al., 2020). The origins of this can be traced back to the software development industry. Agile's pillars, namely iterative development, client collaboration, and adaptability, have shown promise in various contexts, including the agricultural industry (Kaim et al., 2019). China plays a crucial role in the global food supply and economic growth due to its significant agricultural production. Climate change, supply chain disruptions, and evolving client preferences pose significant challenges (Zhao et al., 2020).

Agricultural businesses are seeking innovative strategies to succeed in their environment. One potential avenue worth exploring is the adoption of agile project management practises (Xiao et al., 2023). Consumer loyalty plays a vital role in the success of e-commerce platforms, particularly in China's agriculture sector, where they have gained significant popularity (Deng et al., 2021). Live broadcast anchors play a significant role in influencing consumer preferences and purchase decisions through direct engagement with consumers via live streaming (Wisker, 2020). The personalities, communication styles, and consumer interactions of individuals can have a substantial influence on customer loyalty (Zhang et al., 2022).

Personality traits play a significant role in shaping behaviour, encompassing interpersonal interactions and responses to different circumstances (Zamani et al., 2017; Zhang et al., 2023). Examining the correlation between personality traits of e-commerce live broadcast anchors and consumer loyalty can provide insights into the complex dynamics of online consumer engagement within the agriculture sector (Zhou et al., 2021). This study aims to investigate the potential impacts of implementing Agile project management principles in the agricultural sector of China, specifically focusing on e-commerce live broadcast anchors (Xiao et al., 2023). This study aims to provide valuable insights into the changing landscape of agricultural marketing and consumer behaviour in the digital era by examining the relationship between anchor personality traits and consumer loyalty (Zhang et al., 2022).

Agile project management is a flexible and iterative approach that aims to improve project adaptability and responsiveness (Gaur et al., 2019). Customer loyalty is the state in which a customer consistently chooses and supports a specific brand or organisation, leading to repeated purchases and positive word-of-mouth recommendations (Tashmagambetova & Bae, 2023). Agile project management, within the scope of the literature review, incorporates the principles of iterative development, customer collaboration, and adaptability. On the other hand, customer loyalty refers to the ongoing patronage and positive engagement of customers (Haryono et al., 2023) (Haryono et al., 2023). Zhang et al. (2023) have conducted prior research on Agile project management and customer loyalty in different contexts. Agile project management has been extensively studied in the software development field. Research has shown that it leads to improved project outcomes, increased customer satisfaction, and higher project success rates (Kaim et al., 2019). Customer loyalty has been thoroughly examined in marketing and consumer behaviour literature, highlighting its importance in enhancing profitability and ensuring sustained success for businesses (Haryono et al., 2023).

Empirical research has examined the correlation between Agile project management and customer loyalty across diverse industries. A study in the IT sector found that Agile methodologies increased customer satisfaction, leading to enhanced customer loyalty (Tashmagambetova & Bae, 2023). A study in the retail industry revealed that implementing Agile supply chain practices can enhance customer loyalty by effectively addressing customer demands and preferences (Deng et al., 2021). The

empirical research findings indicate that Agile project management has the potential to exert a positive influence on customer loyalty. According to Hadjinicolaou et al. (2020), the utilisation of agile methods has the potential to significantly alter consumer experiences and influence their loyalty towards digital platforms within the realm of e-commerce. Agile practices possess inherent qualities of flexibility and responsiveness, which equip organisations with the ability to effectively address evolving customer requirements. Consequently, this capability has the potential to result in heightened levels of customer satisfaction and loyalty (Zhao et al., 2020). Hence, it is postulated that the implementation of Agile project management has a substantial influence on customer loyalty.

The theory of Relationship Marketing highlights the significance of establishing and sustaining enduring relationships with customers in order to attain consistent business prosperity (Wisker, 2020). The customer-centric approach and iterative feedback loops of Agile project management closely align with the principles of Relationship Marketing Theory (Deng et al., 2021). Organisations that employ Agile methodologies are likely to cultivate stronger customer relationships and enhance customer loyalty through consistent customer engagement, adaptive responses to evolving customer needs, and the delivery of valuable outcomes (Zhang et al., 2022).

Accordingly, drawing upon the principles of Relationship Marketing Theory, we posit that there exists a hypothesis suggesting a substantial influence of Agile project management on the level of customer loyalty. In conclusion, the existing body of literature indicates that Agile project management possesses the capacity to exert a favourable impact on customer loyalty. The hypothesis is substantiated by empirical research, which establishes the connections between Agile practices, customer satisfaction, and loyalty (Kaim et al., 2019). Furthermore, the congruence between Agile principles and Relationship Marketing Theory substantiates the proposition that Agile project management can significantly contribute to the augmentation of customer loyalty across diverse industry settings.

H1. Agile project management significantly impacts customer loyalty.

personality traits encompass the enduring attributes, actions, and attributes that establish an individual's unique and consistent cognitive, emotional, and

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behavioural patterns (Gaur et al., 2019). Within this particular framework, the term “e-commerce live broadcast anchors” refers to individuals who assume the role of hosts during live streaming sessions on e-commerce platforms. Their primary objective is to exhibit products and actively interact with viewers (Zhou et al., 2021). The literature on the subject has traditionally focused on the utilisation of agile project management in software development, project management, and other business processes (Tashmagambetova & Bae, 2023). In contrast, extensive research has been conducted in the domains of organisational behaviour and psychology to examine personality traits encompassing emotional stability, conscientiousness, extraversion, and openness to new experiences (Deng et al., 2021).

There is a limited amount of empirical research available regarding the influence of Agile project management on the personality traits of e-commerce live broadcast anchors (Xiao et al., 2023). However, previous studies conducted in relevant fields may provide valuable perspectives. For example, research conducted in the domain of organisational behaviour has demonstrated that personality traits and behaviour can be influenced by work environments and leadership styles (Ichsan et al., 2021). The personalities of e-commerce live broadcast anchors may be influenced by Agile project management principles, which have the potential to cultivate characteristics such as adaptability, customer-centricity, and effective communication (Wang et al., 2023).

Although there is a scarcity of direct empirical research investigating this particular hypothesis, there exists indirect evidence that implies the potential influence of Agile project management principles on the personality traits of e-commerce live broadcast anchors (Zhang et al., 2023). Frequently, these anchors are required to adapt their communication styles, address customer feedback, and manage dynamic circumstances while conducting live broadcasts. Agile methodologies have the potential to foster the development of certain personality traits, including flexibility, customer orientation, and communication skills, among individuals (Haryono et al., 2023). Therefore, it is postulated that the implementation of Agile project management has a substantial influence on the personality traits exhibited by e-commerce live broadcast anchors (Wisker, 2020).

In contrast to the preceding hypothesis, this particular hypothesis may not exhibit a direct correlation with Relationship Marketing Theory, as its primary emphasis

lies in the realm of customer relationships and loyalty. The utilisation of agile methods possesses the potential to revolutionise consumer experiences and influence their loyalty towards digital platforms within the realm of electronic commerce (Hadjinicolaou et al., 2020). In a tangential manner, the principles of Agile project management, which place emphasis on customer collaboration and responsiveness, exhibit alignment with Relationship Marketing Theory by prioritising the fulfilment of customer needs and expectations (Deng et al., 2021). Hence, the implementation of Agile project management methodologies may have an indirect impact on the improvement of e-commerce live broadcast anchors' ability to effectively engage with customers and, subsequently, their personality traits.

In brief, the existing body of empirical research examining the effects of Agile project management on the personality traits of e-commerce live broadcast anchors is currently limited. However, there exists a theoretical foundation that posits the potential influence of Agile principles on the cultivation of personality traits among individuals engaged in dynamic and customer-centric positions (Ichsan et al., 2021). The hypothesis is formulated by considering the potential of Agile project management to influence these characteristics through the promotion of adaptability and the implementation of effective customer engagement strategies.

H2. Agile project management significantly impacts on personality traits of e-commerce live broadcast anchors.

The study of personality traits has been the focus of extensive research in the fields of psychology and organisational behaviour (Wang et al., 2023). The identification of different personality dimensions has been documented by researchers, including extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience (Widodo & Napitupulu, 2023). The concept of customer loyalty has received considerable attention in the fields of marketing and consumer behaviour research. Scholars have emphasised its importance in fostering repeat patronage and ensuring sustained profitability for businesses (Tashmagambetova & Bae, 2023). The empirical investigation has examined the correlation between the personality traits exhibited by e-commerce live broadcast anchors and the level of customer loyalty. Research conducted in the domain of consumer behaviour has revealed that individuals frequently establish emotional bonds with brands and individuals they come across via media and advertising (Kang, He, & Shin, 2020).

Hence, it is evident that the personality traits and communication styles exhibited by e-commerce live broadcast anchors have a substantial impact on the perceptions, trust, and loyalty of viewers. Empirical research offers robust evidence in favour of the hypothesis that the personality traits exhibited by e-commerce live broadcast anchors have a substantial influence on customer loyalty (Ichsan et al., 2021). According to a recent study conducted by Widodo and Napitupulu (2023), there exists a direct relationship between the personality traits exhibited by live streaming anchors and online purchase intentions, as well as customer loyalty. The study revealed that viewers are more inclined to actively participate and engage in repeat purchases when they establish a connection with the anchor's personality. The establishment of trust and rapport between consumers and e-commerce influencers has been found to have a positive impact on consumer loyalty (Wan & Jiang, 2023).

Drawing on Relationship Marketing Theory can also help to explain the relationship between the personality traits of e-commerce live broadcast anchors and customer loyalty (Wisker, 2020). The aforementioned theory places significant emphasis on the significance of establishing and cultivating enduring relationships with clientele (Wang et al., 2023). E-commerce live broadcast anchors are more prone to establishing robust emotional connections with their audience when they exhibit personality traits that resonate with viewers, including trustworthiness, likability, and relatability (Deng et al., 2021). The establishment of these connections, which are founded upon favourable personality characteristics, has the potential to result in heightened customer loyalty as viewers persist in their engagement with and endorsement of the anchor's content. In conclusion, the hypothesis positing that customer loyalty is significantly influenced by the personality traits of e-commerce live broadcast anchors is supported by empirical research and theoretical frameworks. The formation of emotional connections between viewers and anchors is a common occurrence, with the personality traits of anchors playing a significant role in shaping these connections. These connections, in turn, have a profound impact on consumer loyalty and purchase intentions (Wan & Jiang, 2023).

H3. Personality traits of e-commerce live broadcast anchors significantly impact on customer loyalty.

Psychological research has placed considerable emphasis on investigating the influence of personality traits on behaviour and outcomes (Widodo & Napitupulu,

2023). The concept of agile project management has become increasingly prominent in the field of project management, with a focus on flexibility and customer-centricity being emphasised (Haryono et al., 2023). The development of customer loyalty, a significant concept in the fields of marketing and consumer behaviour, has been the subject of extensive research, with a particular focus on the factors that influence it (Reichheld & Sasser, 1990). There is a scarcity of empirical research examining the mediating role of personality traits in the association between agile project management and customer loyalty (Gaur et al., 2019). However, previous studies conducted in relevant fields offer valuable perspectives. Research conducted on consumer behaviour has demonstrated that the personality traits and communication styles exhibited by brand representatives have the potential to impact consumer perceptions and foster brand loyalty (Wang et al., 2023).

Likewise, within the realm of project management, the customer-centric orientation inherent in Agile methodologies has been associated with enhanced levels of customer satisfaction (Kang et al., 2020). Although there is a limited amount of direct empirical research available on this particular hypothesis, there exists theoretical backing for the notion that the personality traits exhibited by e-commerce live broadcast anchors could potentially act as mediators in the association between agile project management and customer loyalty (Wan & Jiang, 2023). Agile project management, with its customer collaboration focus, can potentially shape the personality traits of anchors by fostering customer-centricity, adaptability, and effective communication. These personality traits, in turn, may influence customer perceptions and loyalty (Deng et al., 2021).

The aforementioned hypothesis can also be linked to Relationship Marketing Theory, a theoretical framework that places emphasis on the establishment and sustenance of enduring customer relationships (Widodo & Napitupulu, 2023). The prioritisation of customer collaboration in Agile project management practices aligns with Relationship Marketing Theory, as discussed by Wisker (2020), in the context of e-commerce live broadcast anchors. The anchor's capacity to effectively engage with customers can be enhanced through the presence of personality traits such as trustworthiness, likability, and customer orientation (Kang et al., 2020). The relationship between Agile project management and customer loyalty may be reinforced by the mediating role of anchor personality traits (Deng et al., 2021).

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In brief, although there is a scarcity of empirical research specifically investigating the mediation role of personality traits in this particular context, there exists a theoretical foundation to propose that the personality traits of e-commerce live broadcast anchors could potentially mediate the association between agile project management and customer loyalty. The customer-centric approach of agile project management has the potential to shape anchor personality traits. These traits, in turn, can

influence customer perceptions and loyalty. This alignment between agile project management and customer perceptions and loyalty is supported by both theoretical and practical considerations (see figure 1).

H4. Personality traits of e-commerce live broadcast anchors significantly mediates the relationship of agile project management and customer loyalty.

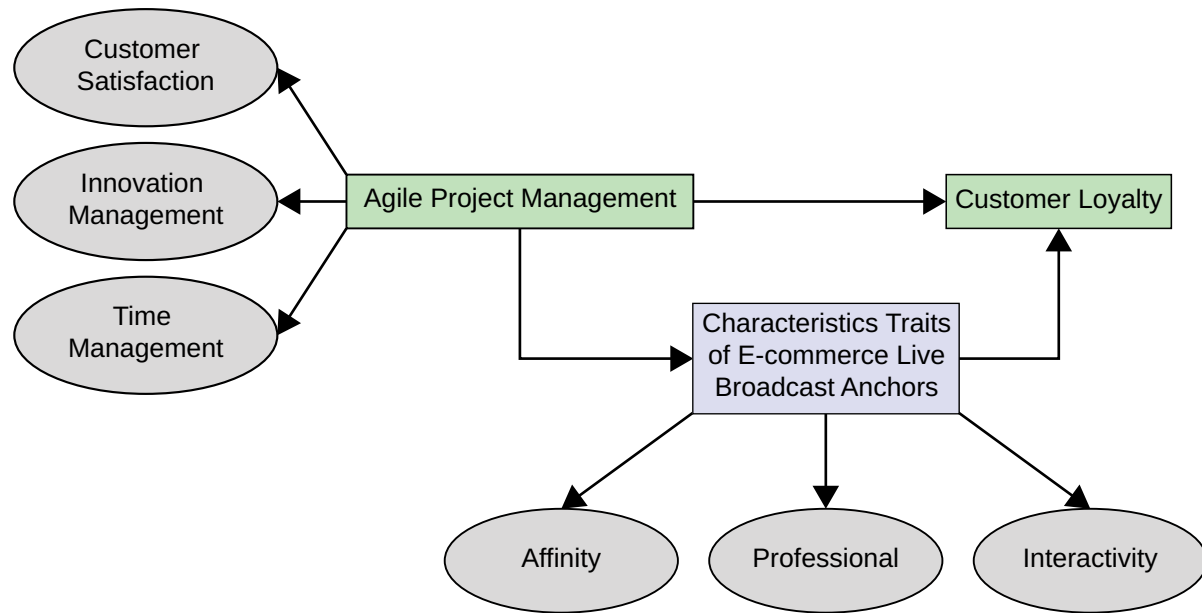


Figure 1: Conceptual Model

3. Methodology

The study collected data from 329 consumers in China’s agricultural sector. A stratified random sampling technique was used to ensure a representative sample. The strata were established according to geographic regions in China in order to encompass the diversity of consumer behaviours and preferences across various agricultural markets. Participants were randomly selected from each stratum in order to reduce bias.

The data collection instrument was a structured questionnaire designed for measuring the variables of interest. The questionnaire was created using established scales and items from prior research on agile project management, personality traits, and customer loyalty. The instrument was translated into Mandarin Chinese and pre-tested with a small group of participants to ensure clarity, comprehensibility, and cultural relevance. The study incorporated

various scales for key variables. Participants were requested to rate their perception of the degree to which the e-commerce platforms they utilise in the agricultural sector implement agile project management principles on a 7-point scale (Mohammed & Jasim, 2018). Participants evaluated the personality traits of e-commerce live broadcast anchors using a 10-item scale. Affinity, Professional, and Interactivity were measured using different scales in previous studies. Affinity was measured using a 4-item scale (Gilly et al., 1998), Professional was measured using a 3-item scale (Frenzen & Davis, 1990), and Interactivity was measured using a 3-item scale (Feng, 2022). Customer loyalty was assessed using a 4-item scale that measured participants’ self-reported intention to continue purchasing products from e-commerce platforms and their likelihood to recommend these platforms to others (Zheng et al., 2015).

Data were collected through an online survey platform, facilitating convenient and efficient data collection. Participants were recruited for the survey through online channels associated with agriculture, including agricultural forums, social media groups, and e-commerce platforms. All participants provided informed consent prior to participating in the survey. Participants were guaranteed that their responses would be kept confidential and anonymous. Partial Least Squares Structural Equation Modelling (PLS-SEM) was utilised for data analysis. Partial Least Squares Structural Equation Modelling (PLS-SEM) is a suitable method for this study due to its effectiveness in handling intricate models and samples of small to medium sizes. This analysis sought to investigate the associations between agile project management, personality traits of e-commerce live broadcast anchors, and customer loyalty. The PLS-SEM analysis included evaluating the reliability and validity of the measurement model as well as performing path analysis to examine the proposed relationships.

4. Results

The measurement scales in this study were

evaluated for reliability using Cronbach’s alpha coefficients. Table 1 displays the Cronbach’s alpha values for the key variables analysed in the study. The Cronbach’s alpha coefficient for the variable “affinity,” which measures participants’ connection to e-commerce platforms, was 0.867. This finding suggests a strong internal consistency among the items used to assess this construct, indicating that the items effectively measure the concept of affinity. The variable “agile project management” had a Cronbach’s alpha of 0.898. The high coefficient indicates that the measurement items pertaining to participants’ perceptions of agile project management principles in e-commerce platforms demonstrated strong internal consistency. The variable “customer loyalty,” which measures participants’ intention to continue purchasing from the platforms and recommending them to others, had a Cronbach’s alpha of 0.831. This finding suggests that the items used to measure customer loyalty demonstrate strong internal consistency, thereby indicating the reliability of this construct.

Table 1: Cronbach’s Alpha

	Cronbach’s Alpha
Affinity	0.867
Agile project management	0.898
Customer loyalty	0.831
Customer satisfaction	0.716
Innovation management	0.727
Interactivity	0.770
Personality traits of e-commerce live broadcast anchors	0.836
Professional	0.718
Time management	0.787

Customer satisfaction and innovation management were assessed using Cronbach’s Alpha coefficients of 0.716 and 0.727, respectively. Both constructs exhibited acceptable internal consistency, despite slightly lower Alpha values. The variable “interactivity,” which measures participants’ level of interaction with e-commerce live broadcast anchors, demonstrated a Cronbach’s Alpha coefficient of 0.770. The findings indicate that the instruments used to assess interactivity in live broadcasts demonstrated acceptable levels of internal consistency. The personality traits of e-commerce live broadcast

anchors demonstrated strong internal consistency, as indicated by a Cronbach’s Alpha coefficient of 0.836. The variables “Professional” and “Time management” demonstrated strong internal consistency, as indicated by Cronbach’s Alpha values of 0.718 and 0.787, respectively. In summary, the Cronbach’s Alpha values for all variables in Table 1 demonstrate strong internal consistency among the measurement items. The findings of this study indicate that the constructs examined are reliable, indicating that the collected data accurately represent the intended concepts (see figure 2).

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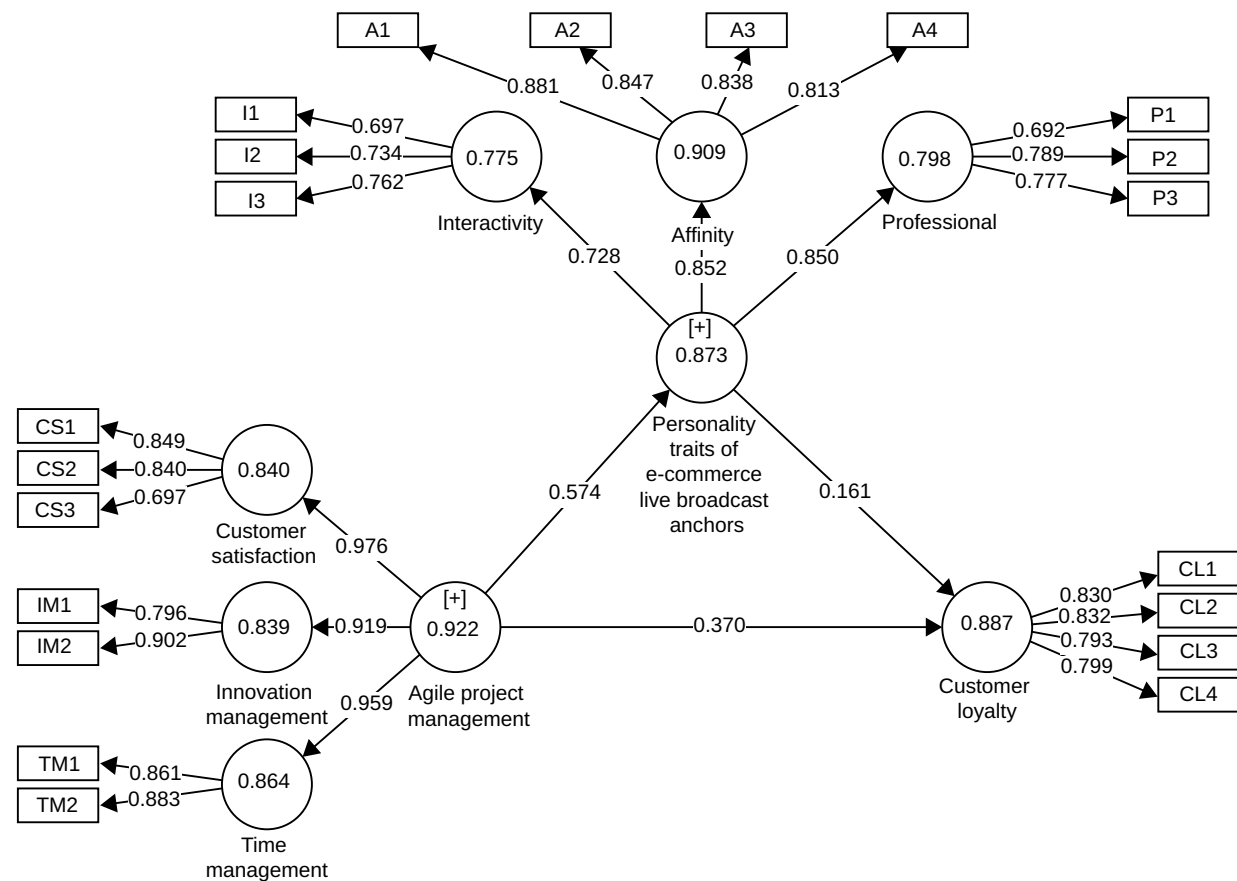


Figure 2: Estimated Model

Table 2 displays the factor loadings, composite reliability, and average variance extracted (AVE) for the primary variables examined in the research. The personality traits of e-commerce live broadcast anchors showed strong factor loadings ranging from 0.873, indicating a significant correlation between the observed items and the underlying construct. A composite reliability of 0.512 and an average variance extracted (AVE) of 0.714 (see Figure 2) indicate that the variable demonstrated satisfactory reliability and convergent validity. The affinity of participants to e-commerce platforms was measured using factor loadings, which ranged from 0.881 (A1) to 0.813 (A4). The composite reliability for affinity was 0.909, indicating strong internal consistency among the items. Additionally, the AVE was 0.714, suggesting sufficient convergent validity. The factor loadings for interactivity in e-commerce live broadcasts ranged from 0.697 (I1) to 0.762 (I3), indicating the level of participant interaction with the anchors. The composite reliability for interactivity was found to be 0.775, indicating a satisfactory level of internal consistency.

Additionally, the average variance extracted (AVE)

was determined to be 0.535, suggesting acceptable convergent validity. The factor loadings for the professional dimension of e-commerce live broadcast anchors ranged from 0.692 (P1) to 0.789 (P2). The professionalism construct demonstrated strong internal consistency with a composite reliability of 0.798. Additionally, the average variance extracted (AVE) was 0.569, indicating satisfactory convergent validity. Customer loyalty was measured by assessing participants' intent to continue purchasing and recommending e-commerce platforms. The factor loadings for customer loyalty ranged from 0.793 (CL3) to 0.832 (CL2). The composite reliability for customer loyalty was found to be 0.887, indicating strong internal consistency. Additionally, the average variance extracted (AVE) was calculated to be 0.662, suggesting satisfactory convergent validity. The factor loading of agile project management was 0.922, indicating a strong relationship with the latent construct. The composite reliability of agile project management was 0.631.

Customer satisfaction, as measured by evaluating satisfaction levels with e-commerce platforms,

exhibited factor loadings ranging from 0.697 (CS3) to 0.849 (CS1). The composite reliability for customer satisfaction was found to be 0.840, indicating satisfactory internal consistency. Additionally, the average variance extracted (AVE) was determined to be 0.637, suggesting acceptable convergent validity. The measurement of innovation management in e-commerce platforms showed factor loadings of 0.796 (IM1) and 0.902 (IM2). The composite reliability of innovation management was 0.839, indicating strong internal consistency. The average variance extracted (AVE) was 0.724, suggesting good convergent validity.

The factor loadings for time management, which reflect the efficiency of e-commerce platforms in managing time, were 0.861 (TM1) and 0.883 (TM2). The composite reliability for time management was found to be 0.864, indicating a high level of internal consistency. Additionally, the average variance extracted (AVE) was calculated to be 0.761, suggesting satisfactory convergent validity. The values in Table 2 show the factor loadings, composite reliability, and average variance extracted (AVE) values. These show how reliable and valid the measurement scales used in this study are. These findings enhance confidence in the accuracy of the collected data and the strength of the constructs being studied.

Table 2: Factor loadings, Composite Reliability, and Average Variance Extracted (AVE)

		Original Sample	Composite Reliability	Average Variance Extracted (AVE)
Personality traits of e-commerce live broadcast anchors			0.873	0.512
Affinity	A1	0.881	0.909	0.714
	A2	0.847		
	A3	0.838		
	A4	0.813		
Interactivity	I1	0.697	0.775	0.535
	I2	0.734		
	I3	0.762		
Professional	P1	0.692	0.798	0.569
	P2	0.789		
	P3	0.777		
Customer loyalty	CL1	0.830	0.887	0.662
	CL2	0.832		
	CL3	0.793		
	CL4	0.799		
Agile project management			0.922	0.631
Customer satisfaction	CS1	0.849	0.840	0.637
	CS2	0.840		
	CS3	0.697		
Innovation management	IM1	0.796	0.839	0.724
	IM2	0.902		
Time management	TM1	0.861	0.864	0.761
	TM2	0.883		

Table 3 displays the outcomes of the Fornell-Larcker Criterion, which evaluates the discriminant validity of the measurement scales. The diagonal values indicate the square root of the average variance extracted (AVE) for each construct, while the off-diagonal values represent the correlations between constructs. The diagonal values of the correlation matrix indicate that the average variance extracted (AVE) for each construct is greater than the correlations between that construct and other constructs, thus demonstrating

satisfactory discriminant validity. This implies that the measurement scales successfully capture separate constructs, as the Average Variance Extracted (AVE) for each construct is higher than its correlation with other constructs, thus satisfying the requirement for discriminant validity. The Fornell-Larcker Criterion results in Table 3 confirm that the measurement scales used in the study demonstrate satisfactory discriminant validity, indicating that each construct is distinct and reliably measured.

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Table 3: Fornell-Larcker Criterion

	1	2	3	4	5	6	7	8	9
Affinity	0.845								
Agile project management	0.312	0.794							
Customer loyalty	0.275	0.462	0.813						
Customer satisfaction	0.308	0.776	0.471	0.798					
Innovation management	0.311	0.619	0.435	0.840	0.851				
Interactivity	0.343	0.785	0.379	0.782	0.669	0.731			
Personality traits of e-commerce live broadcast anchors	0.852	0.574	0.373	0.573	0.524	0.728	0.642		
Professional	0.575	0.368	0.272	0.376	0.345	0.575	0.850	0.754	
Time management	0.272	0.959	0.407	0.925	0.810	0.783	0.536	0.322	0.872

Table 4 displays the outcomes of the Heterotrait-Monotrait (HTMT) ratio of correlations. This method evaluates discriminant validity by comparing the correlations between distinct constructs with the correlations within the same construct. The table displays correlations between different constructs in the off-diagonal values, while the diagonal values represent correlations within the same construct. Table 4 displays the HTMT ratios, which indicate that the correlations among different constructs are lower compared to the correlations within the same construct. This suggests that discriminant validity is upheld.

The HTMT ratios for “Agile project management” with “Customer loyalty” and “Personality traits of e-commerce live broadcast anchors” are 0.534 and 0.449, respectively, both below the threshold of 1. This finding confirms that the measurement scales are able to effectively differentiate between different constructs and demonstrate satisfactory discriminant validity. Table 4 provides evidence of discriminant validity for the measurement scales. The HTMT ratios indicate that the correlations between different constructs are lower than the correlations within the same construct. This suggests that the constructs are distinct and reliably measured.

Table 4: HTMT

	1	2	3
Agile project management			
Customer loyalty	0.534		
Personality traits of e-commerce live broadcast anchors	0.670	0.449	

Table 5 presents important metrics that assess the model’s accuracy and predictive capabilities. The Q²predict value of 0.831 indicates that the model exhibits robust predictive abilities, explaining a substantial amount of the variance in the dependent variable. The RMSE value of 0.068 and MAE value of 0.083 suggest that the model’s predictions are in close agreement with the actual data, indicating a strong fit and accurate predictive performance. The metrics used in this study indicate that the model employed is effective in elucidating and forecasting the relationships between the variables being examined.

measure that quantifies the amount of variability in the dependent variable that can be accounted for by the independent variables in a regression model. Customer satisfaction has the highest R² value of 0.952, indicating a strong explanatory power for variations in customer satisfaction levels. The R² value of 0.845 indicates that Innovation management has a strong and significant impact on the variance in innovation management within e-commerce platforms. The R² values for Affinity and Professional are 0.725 and 0.722, respectively, indicating that these variables account for a significant amount of the variability in affinity and professionalism levels.

Table 5: Model Fitness

Q ² predict	RMSE	MAE
0.831	0.068	0.083

Interactivity and time management contribute moderately to the explanation of variance, with R² values of 0.530 and 0.519, respectively. The R² values for customer loyalty and anchor personality traits in e-commerce live broadcasts are relatively

Table 6 displays the R-squared (R²) values for the variables analysed in the study. R² is a statistical

low, with values of 0.231 and 0.330, respectively. This suggests that these variables account for a smaller amount of the variability in customer loyalty and anchor personality traits. These findings imply that additional factors, not considered in the model, may contribute to the explanation of these two variables. Table 6 presents the explanatory power

of the variables in the study. It shows that Customer satisfaction and Innovation management have strong explanatory capabilities. However, Customer loyalty and Personality traits of e-commerce live broadcast anchors are influenced by other factors not included in the model.

Table 6: R-Square

Variable	R-square
Affinity	0.725
Customer loyalty	0.231
Customer satisfaction	0.952
Innovation management	0.845
Interactivity	0.530
Personality traits of e-commerce live broadcast anchors	0.330
Professional	0.722
Time management	0.519

Table 7 presents the f-statistics values used to evaluate the significance of relationships between variables in regression analysis. The f-statistics in this table analyse the effects of agile project management on customer loyalty and personality traits of e-commerce live broadcast anchors. The f-statistics value of 0.119 indicates that there is no statistically significant relationship between agile project management and customer loyalty. This suggests that agile project management does not significantly explain the variability in customer loyalty. The f-statistics value of 0.492 indicates a statistically significant

relationship between agile project management and the personality traits of e-commerce live broadcast anchors. This suggests that agile project management significantly influences the variability in personality traits of these anchors. Table 7 demonstrates the significance of the associations between agile project management and the two dependent variables. It reveals a statistically significant influence on the personality traits of e-commerce live broadcast anchors, while no significant impact is observed on customer loyalty.

Table 7: F-statistics

	Customer loyalty	Personality traits of e-commerce live broadcast anchors
Agile project management	0.119	0.492
Personality traits of e-commerce live broadcast anchors	0.023	

Table 8 presents the outcomes of the path analysis, illustrating the connections between variables and their corresponding statistical measures. A path coefficient of 0.370 indicates that agile project management has a significant impact on customer loyalty. This suggests that Agile project management practices play a crucial role in influencing customer loyalty. The T-statistic of 3.333 and the P-value of 0.000 provide strong evidence for the statistical significance of the relationship between Agile project management and customer

loyalty. This suggests that the observed impact is not a result of random chance. The personality traits of e-commerce live broadcast anchors are significantly influenced by Agile project management, as indicated by a path coefficient of 0.574. This suggests that Agile project management practices have a considerable impact on shaping the traits of these anchors. The relationship is statistically significant, as indicated by the high T-statistic of 7.638 and a P-value of 0.000 (see figure 3).

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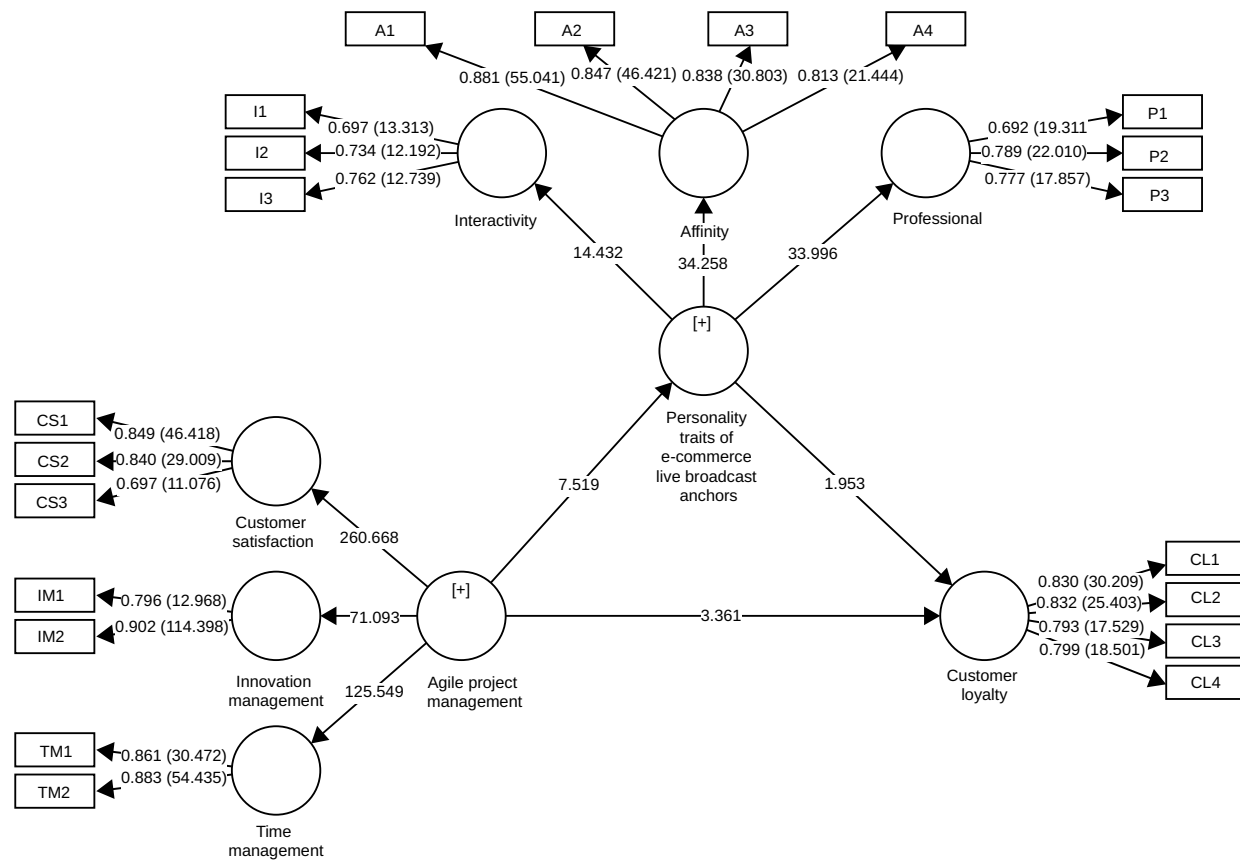


Figure 3: Structural Model

The personality traits of e-commerce live broadcast anchors have a noteworthy effect on customer loyalty. A path coefficient of 0.161 supports this and shows that viewers' opinions of the anchor's personality directly affect their loyalty to the e-commerce platform. The T-statistic of 1.908 and the P-value of 0.028 provide evidence of the statistical significance of this relationship. The personality traits of e-commerce live broadcast anchors play a significant role in mediating the relationship between Agile project management and customer loyalty, as indicated by a path coefficient of 0.092. The mediation effect indicates that Agile project management has a partial influence on customer loyalty by affecting the personality traits of the anchors.

The T-statistic of 1.718 and the P-value of 0.043 provide evidence for the statistical significance of the mediation effect. Table 8 provides significant evidence regarding the associations among Agile project management, personality traits of e-commerce live broadcast anchors, and customer loyalty. Agile project management has a significant impact on customer loyalty and personality traits. Moreover, the personality traits of anchors serve as a mediator in the association between Agile project management and customer loyalty. This underscores the intricate interaction among these variables within the framework of e-commerce live broadcasts (see table 8).

Table 8: Path Analysis

	Original Sample	Standard Deviation	T Statistics	P Values
Agile project management significantly impacts customer loyalty.	0.370	0.111	3.333	0.000
Agile project management significantly impacts on personality traits of e-commerce live broadcast anchors.	0.574	0.075	7.638	0.000
Personality traits of e-commerce live broadcast anchors significantly impact on customer loyalty.	0.161	0.084	1.908	0.028
Personality traits of e-commerce live broadcast anchors significantly mediates the relationship of agile project management and customer loyalty.	0.092	0.054	1.718	0.043

5. Discussion

This research focuses on analysing the study's findings and results, and connecting them with the existing literature to offer a comprehensive understanding of the research outcomes. The study's first key finding emphasises the substantial influence of Agile project management on customer loyalty within China's e-commerce industry, specifically in the agricultural sector. The path analysis demonstrates a significant positive correlation between Agile project management practises and customer loyalty. This outcome is consistent with the principles of Agile project management, which prioritise customer collaboration, adaptability to evolving customer requirements, and the continuous delivery of customer value (Wan & Jiang, 2023). The literature underscores that customer loyalty is influenced by customer-centric strategies and experiences (Deng et al., 2021). In the realm of e-commerce, where customer interaction primarily occurs online, the implementation of Agile practises that improve customer satisfaction and engagement has the potential to foster greater customer loyalty. This finding highlights the significance of Agile project management in promoting customer loyalty in the agricultural e-commerce industry in China (Yawised et al., 2022).

The study's second significant finding emphasises the significant impact of Agile project management on the personality traits of e-commerce live broadcast anchors. The findings suggest a notable and favourable correlation between Agile project management practices and anchor personality traits. The study by Kang et al. (2020) highlights the ability of Agile methodologies to enhance project management through their adaptability and responsiveness. Agile methodologies facilitate organisations in promptly adapting to customer preferences and market dynamics, thereby promoting the cultivation of traits that are customer-centric and adaptable. This is consistent with the existing research on relationship marketing, which highlights the significance of establishing robust emotional bonds with customers (Haryono et al., 2023). In the realm of e-commerce live broadcasts, anchors who possess amiable, reliable, and customer-centric personalities are more inclined to establish rapport and engagement with viewers, ultimately resulting in heightened customer loyalty (Wan & Jiang, 2023).

The study's third finding highlights the substantial influence of e-commerce live broadcast anchors' personality traits on customer loyalty. This discovery emphasises the significance of the human factor in digital interactions, specifically in the realm of live

broadcasts. Viewers establish emotional bonds with anchors who display personality traits that resonate with them, including trustworthiness, likability, and relatability. This finding is consistent with previous research on consumer behaviour, which highlights the tendency of consumers to develop emotional connections with brands and individuals they come across in media and advertising (Haryono et al., 2023). This finding highlights the significant impact of anchor personality traits on customer loyalty in China's agricultural e-commerce sector.

The fourth finding enhances our understanding by indicating that the personality traits of e-commerce live broadcast anchors mediate the relationship between Agile project management and customer loyalty. The mediation effect indicates that Agile project management practices have an indirect influence on customer loyalty by influencing the personality traits of anchors. This finding suggests that Agile project management positively impacts adaptability, customer focus, and responsiveness, which subsequently affects the personalities of anchors. The existing literature on mediation in marketing and consumer behaviour provides additional support for this concept by emphasising the role of specific factors in mediating the relationship between other factors (Zhang et al., 2022).

In summary, this study provides significant contributions to the agricultural e-commerce industry in China. This highlights the importance of Agile project management practices in promoting customer loyalty and shaping the personality traits of e-commerce live broadcast anchors. Additionally, it emphasises the significant impact of anchor personality traits on fostering customer loyalty. The mediation effect enhances our comprehension of complex dynamics. The results of this study have practical implications for agricultural e-commerce organisations. They indicate that implementing Agile project management practices can have a positive effect on customer loyalty by fostering the development of customer-centric anchor personalities. Future research in this field can investigate additional factors that may interact with Agile project management and anchor personality traits to further enhance our comprehension of customer loyalty in the digital age.

6. Conclusion

This study explored the complex dynamics of the agricultural e-commerce industry in China, specifically investigating the connections between Agile project

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management, the personality traits of e-commerce live broadcast anchors, and customer loyalty. The study's findings have important implications for businesses in this sector. Agile project management is recognised as a significant factor in fostering customer loyalty, highlighting the value of adaptable and customer-centric strategies in a rapidly changing digital environment. Additionally, this study highlights the significant impact of e-commerce live broadcast anchors' personality traits on customer loyalty. It emphasises the importance of relatable, trustworthy, and engaging anchor personalities in promoting customer engagement and loyalty.

Moreover, this study reveals a mediation effect wherein Agile project management indirectly affects customer loyalty by influencing anchor personality traits. This finding enhances our comprehension of the underlying mechanisms in the field of digital marketing. The results highlight the importance for agricultural e-commerce organisations to implement Agile project management practices and cultivate anchor personalities that appeal to their target audience. In the rapidly changing digital landscape, these insights provide valuable guidance for businesses aiming to succeed in the competitive e-commerce industry. Customer loyalty and engaging anchor personalities are crucial factors for achieving success.

Theoretical and Practical Implications

This research makes significant contributions to the current theoretical landscape. This study expands the scope of Agile project management by examining its application in e-commerce, specifically within the agricultural sector in China. This study contributes to the theoretical framework of customer relationship management and highlights the relevance of Agile principles in digital marketing by showing the significant impact of Agile project management practices on customer loyalty. Furthermore, this study contributes to our understanding of how project management practises and the personalities of e-commerce live broadcast anchors interact. This perspective enhances relationship marketing theory by emphasising the influence of anchor personality traits on customer loyalty. This study offers valuable insights into the impact of human interactions in digital contexts on consumer behaviour. It contributes to the theoretical understanding of brand-consumer relationships specifically in the context of live broadcasts.

The research findings have practical implications for businesses in the agricultural e-commerce sector in China and other regions. Organisations can derive

advantages by implementing Agile project management practices, as these have demonstrated a positive impact on customer loyalty. This involves adopting flexibility, engaging with customers, and consistently delivering value in project management processes, ultimately improving the customer experience and cultivating loyalty. Additionally, businesses can utilise the knowledge regarding the importance of anchor personality traits in influencing customer loyalty. To achieve this, it is advisable for them to allocate resources towards the recruitment and development of e-commerce live broadcast anchors who possess qualities such as trustworthiness, likability, and customer orientation. These anchors have the potential to foster deeper emotional connections with viewers, leading to heightened engagement and brand and platform loyalty.

Furthermore, it is important for organisations to acknowledge the influence of anchor personality traits and view them as a strategic tool to indirectly improve customer loyalty through the implementation of Agile project management. This understanding can help organisations align their project management practices with the development of anchor personalities that appeal to their target audience, thereby optimising their marketing efforts. In conclusion, this research highlights the significance of integrating Agile project management practices with the development of customer-centric anchor personalities to improve customer loyalty in the agricultural e-commerce industry. These insights can guide strategic decision-making and operational approaches for businesses aiming to succeed in the dynamic digital marketplace.

Limitations and Future Research

It is important to recognise the limitations of this research, despite its valuable insights. The study specifically examined the agricultural sector of e-commerce in China. The findings may have limited generalizability to other sectors or regions. Future research should investigate the suitability of Agile project management and anchor personality traits in various industries and cultural contexts to gain a more comprehensive understanding of their influence on customer loyalty. Additionally, this study utilised self-reported data from consumers, potentially leading to response bias and subjectivity. Future research should consider integrating diverse data sources and methodologies, such as observational data and qualitative interviews, in order to enhance the validity of findings and offer a comprehensive understanding of the examined relationships. Additionally, the

study utilised a cross-sectional design to capture a momentary depiction of the relationships at a particular time. Longitudinal studies can be conducted to examine causality and the evolution of relationships over time. These studies would track changes in Agile practises, anchor personalities, and customer loyalty over an extended period.

Based on the existing research, there are several potential areas for future investigation. Examining the impact of Agile project management principles, such as Scrum and Kanban, on customer loyalty could yield more detailed insights. The impacts of different Agile methodologies on customer loyalty may vary and therefore require further investigation. The study primarily examined the positive effects of Agile project management and anchor personality traits. Further research should explore the potential adverse effects or unintended consequences associated with these factors in order to present a more comprehensive perspective. Additionally, it would be beneficial to investigate the moderating variables that could potentially impact the relationships under scrutiny in this study. These variables include the specific agricultural product being analysed and the level of maturity of the e-commerce platform.

Such an analysis would enhance our comprehension of the contextual factors involved. Future studies could investigate the impact of emerging technologies, such as artificial intelligence and virtual reality, on customer loyalty and viewer interactions in live broadcast settings, given the rapid technological advancements in e-commerce, especially in China. In conclusion, the implementation of comparative studies encompassing diverse e-commerce platforms and industries has the potential to yield significant insights pertaining to the distinctive dynamics of customer loyalty, Agile project management, and anchor personalities within diverse digital marketplaces. In conclusion, this study provides various promising prospects for further exploration, granting researchers the chance to delve more profoundly into the intricate dynamics influencing customer loyalty in the era of digitalization.

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