Research on the short video communication ecology and live streaming sales model of agriculture, rural areas and farmers in Shaanxi-Data analysis and strategy optimization based on the Tiktok platform

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Abstract The current analysis is dedicated to the agriculture, rural areas and farmers short videos published on Tiktok in Shaanxi Province, especially focusing on the communication Ecology and the livestream e-commerce models underlying these videos. After doing an analysis of the data and a number of case studies, the research team was able to make several important conclusions. For one, there is little doubt that top-level accounts have great power over content usage and commercial conversion, but such accounts appear to be very reliant on platform recommendations. Some small and medium-sized accounts also seem to have problems with low or negative growth of followers. In the realm of live stream e-commerce, accounts with large followings perform well and certain mid-tier accounts are able to have high conversion rates. But, as is often the case, the monetisation models are rather shallow. The study suggests improvements in the fusion of short-form videos and livestreams, in the content scope, and in the business approaches to stimulate economic development and rural rejuvenation in Shaanxi Province through digital capital.

Index Terms Shaanxi Agriculture, Short Video, Livestream E-commerce, Tiktok, Communication Strategy

I. Introduction

Shaanxi has a complex topography with great differences in altitude and ecological conditions, forming 10 distinct agroclimatic zones from north to south, and 24 distinctive plantation climate type zones from east to west [1]-[3]. All aspects of crop types, farming and cultivation systems, people's lives, production methods and socio-economic conditions are characterized by intermediate types of transition between the north and the south, as well as between the south and the north, and unique resource advantages [4]-[6]. In this short-video era, through the effective and rational application of short-video to Shaanxi agriculture, rural areas and farmers, not only can improve the visibility of Shaanxi comprehensive agriculture, but also can take the opportunity to utilize short-video platforms such as Tiktok for the sale of agricultural products, and to improve the income and life motivation of farmers [7]-[10].

TikTok is a very hot short video social platform [11]. At the beginning, TikTok is just a social media platform that can provide entertainment, leisure, and information, and with the continuous growth of its users, its large user base allows enterprises and organizations to see its broad market potential, TikTok gradually developed into a comprehensive platform that combines multiple fields and functions such as advertisement implantation and live broadcasting and sales in addition to short-video dissemination [12]-[15]. This wave of short videos and live streaming is also having a significant impact on the marketing strategies of various industries, especially on the agricultural industry [16], [17]. As TikTok can quickly attract users' attention and enhance their memory due to its short and exciting characteristics, it is evident that Shaanxi agriculture can visualize the health, safety, and organic characteristics of its products by producing short videos to show the growth process, planting technology, and quality inspection of the products [18]-[21]. At the same time, interesting elements can be added to the short videos, such as farmers' stories, agricultural products knowledge science and so on, in order to increase the interest and interaction of users, and optimize the marketing strategy of the products based on the platform data analysis [22]-[24].

It is the policies, social needs, and tech progress that are stimulating faster growth of the short video industry of Shaanxi's agriculture, which is no longer a mere economic activity, but also a means of spreading rural culture. In this context, this work will analyze the current state of agriculture, rural areas and farmers short videos in Shaanxi,

look into the details of its communication ecology, and formulate recommendations, thereby contributing to the design of rural development strategies.

II.   Research Methodology

The goal of the study is to examine the communication ecology and livestream e-commerce systems of agriculture, rural areas and farmers short videos in Shaanxi province with special emphasis on how creators at different levels of the hierarchy perform in terms of content dissemination, user engagement, and commercial conversion in order to devise optimal communication strategy adjustments. This goal will be accomplished through integrated research which combines quantitive and qualitative methods organized into several constituent areas. The subject of the primary research is the self-media platform Tiktok. At the end of 2023 Tiktok had attained 1 billion users, 30,000 accounts with more than one million followers and around 470,000 accounts with more than 100,000 followers, which makes it the most powerful self-media platform in China. Such platforms allow us to draw subjects from them and analyze the agricultural content from all appropriate thematic and expressive angles giving a comprehensive view of the agricultural portrayal in the short video form.

This research integrates data from Chanmama and Huitun in order to track agricultural content creators from Shaanxi Province. Using these platforms, a total of 998 agricultural content creators were found with at least 1,000 followers. Out of these, 140 were actively livestreaming in the month of November 2024. The collection of data emphasized several important measures: creator profile information includes. location, whether or not commerce features had been activated, amount of content published, total engagements, follower count, average engagement rate per post, sales revenue, and livestream performance indicators include number of broadcasts, average viewers per broadcast, average viewers per day, revenue from live broadcasts, revenue from average sales, and distribution of referrals.

Applying these measures overall allows for more in-depth understanding of the complex components that define the agriculture short videos in Shaanxi province on the Tiktok platform.

The primary focus of this research is on data analysis, case studies, and comparative analysis, leveraging information from two analytic sources, Chanmama and Huitun, to assess the state of communication ecology and livestream e-commerce in Shaanxi's agriculture, rural areas and farmers short videos. The approaches are enumerated as follows:

Data Analysis Approach: Statistical evaluation was performed on basic account-level data accrued from the sample (creator's user name, number of followers, amount of content produced, average likes received, status of commerce enablement, etc) and livestream statistics (broadcasting frequency, average audience, revenue from sales during livestream sessions, and recommendation driven traffic) to identify key factors and development patterns. Their account structures, engagement behavior, and monetization impacts were supported quantitatively by descriptive statistical calculations of averages, medians, growth rates, and other measurements, including, but not limited to, the means of, and participation in, account hierarchical structures, user interactions, and business monetization effectiveness. For instance, the differences between mid-tier and top-tier accounts in terms of follower count, engagement, and sales revenue generated through livestreams indicates the existence of stratification and the underlying dangers of the agricultural short video ecosystem.

Case Study Method: The investigation performs case study analyses of illustrative cases in the sample such as "Paoshan Ah Hong" and "Fan Xiang Jun Ge." By analyzing their short video and livestream operational data, the study seeks to understand their content production, user interaction, and marketing conversion tactics, capturing both successful and unsuccessful strategies. This qualitative analysis aids in identifying important factors in the actual operationalization of agriculture, rural areas and farmers short videos, which is insightful for informing future strategies in communication.

Comparative Analysis Method: The research carries out a vertical comparative descriptive analysis among the different account samples, performing the analysis showing the comparison results of the different account types and sizes for every level. Specifically, attention is given to the disparity between the above average accounts and the middle accounts regarding their geographic location, follower increase rate, engagement rate, and rate of commercialization to find out their strengths and weaknesses. At the same time, the study evaluates the effect of platform algorithms on the efficiency of livestream e-commerce by comparing the number of views, sales revenue, and share of traffic generated through recommendations across different accounts, and therefore hypothesizes relevant improvement solutions.

In summary, this research design is fundamentally data-driven, integrating case studies and comparative analysis to construct a comprehensive data model of the communication ecology of Shaanxi's agriculture, rural areas and farmers short videos. The methodology reveals key issues in current content dissemination and commercial monetization from multiple perspectives, aiming to uncover the intrinsic patterns governing agriculture,

rural areas and farmers short videos in Shaanxi with respect to content dissemination, user engagement, and commercial conversion. Based on these findings, the research proposes targeted and practical communication strategy optimization recommendations, providing both theoretical support and practical reference for the integrated development of rural revitalization and the digital economy.

III. Results

III. A. Analysis on the ecological communication of short videos on agriculture, rural areas and farmers in Shaanxi

III. A. 1) Platforms and Mechanisms for the Distribution of agriculture, rural areas and farmers short videos

The great penetration of mobile internet together with the implementation of digital rural development strategies has led to the emergence of short videos as an important media for rural information, cultural, as well as agricultural marketing. In Shaanxi province, agriculture, rural areas and farmers short videos have multichannel distribution which vary by the characteristics of different user categories, their algorithmic recommendation systems, content ecosystems and the commercial model. At the same time, the mechanisms of dissemination of these short videos are multi-faceted in nature being algorithmic recommendations, social media based, livestream based and geographical. Understanding these mechanisms helps develop communication optimally for their purpose and maximize dissemination effectiveness.

(1) Distribution Channels of Agri-Related Short Videos

Tiktok is the biggest distributor of agriculture, rural areas and farmers short videos and dominates the market because of its highly developed interest-based recommendation systems and a developed short video ecosystem. As reported in the "2023 China Short Video Industry Report," the daily active users on Tiktok are above 800 million and a significant portion of them are from rural areas. The platform uses algorithms to recommend user videos that perfectly match their interests and facilitates the broad dissemination of agricultural science, rural lifestyle videos, and agricultural products. For example, famous short video influencer "Paoshan Ah Hong" from Shaanxi creates content about rural daily activities, rural food cooking, and product endorsement which has earned her over 5 million followers. She integrates short videos with livestream selling, showcasing local products like Qinling honey and northern Shaanxi millet, and makes hundreds of thousands of yuan in a single livestream.

The Kuaishou platform's emphasis on community culture and user retention is evident from the self-service recommendation system which allows small and medium-sized users to build a stable follower base with relative ease. The "Kuaishou Rural Revitalization Report 2023" shows that users from rural areas make up more than 40% of Kuaishou's user base and that the engagement rate of content in agriculture exceeds that of other vertical domains. For instance, taking "Lao Liu Yangyang" from northern Shaanxi, he has over three million followers as he documents his daily sheep farming activities on the Loess Plateau, and due to the high user trust, he has excellent livestream e-commerce conversion rates with thousands of monthly orders of Northern Shaanxi mutton along with other specialty agricultural products.

Exploiting WeChat's vast social relationship network, channels have a unique advantage over the private domain traffic. Their circulation system is not centered on social recommendations or SEO as with Tiktok or Kuaishou, but rather facilitates the large scale dissemination of quality content via Wechat Moments, groups, and official accounts. In accordance with the "2023 WeChat Ecosystem Report," users actively utilizing WeChat Channels exceeds 400 million on a daily basis. A good example is the Shaanxi agricultural product brand "Qinling Wild Tea" who uses Wechat Channels to market southern Shaanxi specialty tea by showcasing tea planting, harvesting, processing via short videos, and selling through WeChat Mini Programs. During the 2023 "Double Eleven" shopping festival, the brand surpassed 5 million yuan in sales, proving the social fission impact Wechat Channels have.

Along with that, Bilibili is excellent at content and knowledge related communication making it most ideal for agricultural science popularization and farming procedure videos. A number of Shaanxi agricultural specialists, who are relatively well known, have educational videos such as "Scientific Apple Cultivation Methods" and "High-yield Wheat Planting Techniques" which bring in a large number of agricultural practitioners, as well as young users, who are interested in farming culture. Agritourism and local specialty food marketing is well illustrated by Xiaohongshu (RED) for instance. The "Southern Shaanxi Tea Farmers" account captures the attention of young, urban consumers by advertising the stunning views of the Qinling tea gardens and the primitive artisanal tea processing, which increases the market popularity of southern Shaanxi tea.

As a whole, the less economically advantaged rural areas benefit from this paradigm since agriculture is the dominant sector in the economy. Predictably, direct effect of the new communications technology as well as other computer-based technology is the Shaanxi agriculture short videos promotion. This promotes the development of public relations in the sphere of science communication, marketing of agricultural products and promotion of rural culture.

(2) Dissemination Mechanisms of Short Videos

Platform-specific contextual factors actively shape how short videos are exposed and shared, and, the recommendation systems unique to each platform is a foregone conclusion that such contextual factors have a huge impact on how the content is disseminated. Platforms like Tiktok and Kuaishou perform user behavioral analysis using various metrics such as users' completion rate, engagement rate, and sharing rate. For instance, Tiktok has interest-based recommendation systems that are reported to be able to deliver recommended videos aligned with the users' interests. Statisticians claim that popular videos on the platform ordinarily have completion rates of over sixty percent and engagement rates exceeding ten percent. On the other hand, Kuaishou uses a decentralized recommendation system that is reported to allow users to retain content longer while also being more exposed to content by small and medium-sized creators. When it comes to audience retention, Tiktok ranks lower compared to Kuaishou. In the WeChat ecosystem, short videos spread mainly through shares from active users and their social networks. Local Governments in Shaanxi and local enterprises that deal with agricultural products promote their videos through WeChat Moments aiming to go viral. A video, "Recommendations for the Top Ten Lamb Paomo Restaurants in Xi'an," written by a food influencer from Shaanxi and published on WeChat Channels is claimed to have received more than half a million views in a day. It triggered a lot of conversations in the comment section showcasing how social media influence dissemination of content.

Not only do short videos contribute to driving traffic towards livestream e-commerce sessions, but they also help in increasing the conversion rates within the livestream rooms by creating trends and suppling pre-warming content. Agricultural short video content creators often post videos like agricultural product traceability for users to trust them more which in turn increases the purchase rates. Data suggests that the conversion rates for combined short video and livestream methods on Tiktok is around 5 to 10 percent, while Kuaishou's livestreams have higher conversion rates ranging from 10 to 15 percent due to greater follower loyalty.

In addition, Agricultural short video content refers to a wide range of topics including countryside life, agricultural pedagogy, rural business, and marketing of agricultural products. Through interactions made in the comment sections, direct message Q and A sessions, and other form of community engagement, the content creators manage to increase users' attention and at the same time boost the trust users have in the videos enabling higher conversion rates.

In Shaanxi, the short video content of agriculture, rural areas and farmers in different regions has different focuses: the northern Shaanxi region mainly focuses on the landscape of the Loess Plateau and characteristic agricultural products (such as northern Shaanxi red dates and mutton); the central region focuses on grain crops and traditional agricultural culture; the southern Shaanxi region focuses on ecological agriculture and characteristic economic crops (such as tea and mushrooms). Local governments and enterprises can combine regional culture to create short video IPs with local characteristics, thereby enhancing the regional brand influence. For example, tea companies in southern Shaanxi have greatly increased product sales by displaying tea garden scenery and traditional tea-making techniques, and combining live broadcasts to sell Qinling high mountain tea.Thus, Shaanxi's agriculture, rural areas and farmers short videos are broadcasted on social media and are affected by different interaction processes. Knowing the features and circulation habits of each platform helps users create an effective content plan and increase the efficiency of messages which enables greater participation in the transformation of the countryside and in the progress of the digital economy.

III. A. 2)   Profile of Agricultural Short Video Creators of Shaanxi

According to sample data, agricultural short video creators in Shaanxi province have a distinctive regional pattern that is stratified and corresponds to geography. Their distribution can be divided into three regions: northern Shaanxi, central Shaanxi, and southern Shaanxi. While some creators in northern Shaanxi seem to cross regional boundaries at times (like "Fan Xiang Jun Ge" who claims to be from Guyuan), they mostly cover content dealing with northern agricultural and pastoral activities along with the Loess Plateau. The region of central Shaanxi, which includes Xi'an and the areas surrounding it, has these creators who account for modern agriculture, as well as those who account for traditional farming culture like "Wilderness Exploration," who has a significant following owing to the narrative depicting agricultural practices and culture. In southern Shaanxi around Hanzhong, there are these creators like "Paoshan Ah Hong" and "Xie Zongtao" who capitalize on the rich ecological agricultural resources and unique mountainous topography, and mostly focus on documenting rural life, promoting agricultural products, and showcasing local customs.

"Paoshan Ah Hong" has 2,149,882 followers with an average of 668,280.2 short video likes, while "Xie Zongtao" has 839,332 followers, showcasing the dominance of southern Shaanxi creators in terms of user engagement and market influence. By shooting short videos on "agriculture, rural areas and farmers", these people presented the image of rural youth who play a leading role in the process of rural revitalization. They are hardworking, brave,

down-to-earth and innovative, changing the traditional image of farmers as poor, stubborn and culturally deficient, thus giving rural people a stronger sense of identity.

(1) Evaluation of Account Scale

In terms of scale, Shaanxi agricultural short video producers possess a clear internal stratification. Pinnacle-level accounts are often over one million followers such as "Paoshan Ah Hong" and "Fan Xiang Jun Ge," who boast 2.1 million and 1.53 million followers respectively and perform exceptionally well in content dissemination and commercial monetization. These pinnacle level accounts have excellent videstance performance indicators; for example "Paoshan Ah Hong" has, to date, 23,738,021 likes on his videos and her livestream e-commerce sales range from 50,000 to 75,000 yuan per session. In contrast, some mid-level accounts possess a relatively lower following (usually a few hundred thousand to a million) but do have a solid standing within certain niche areas or regional markets. "Shan Nan Shishi" is an example of this; she possesses 1,248,926 followers, however, her content only averages 1,449.7 likes but is a lot of interest on many issues. "Wilderness Exploration" is another example with 1,020,648 followers with a very high content production of 1,138 videos and an average of 4,613.0 likes per video. In general, all levels within the hierarchy do have a primary coordination focus with the higher levels converting better commercially with greater content quality through multi-channel operations and the mid levels being unique in regionally targeted marketing and local culture dissemination.

(2) Analyzing Content Types

When it comes to video types, short video creators from Shaanxi agriculture specialize in three principal areas: agricultural science diffusion, rural life documentation, and agribusiness marketing. The audience for agricultural science diffusion videos consists of farmers in need of professional guidance, as well as urban residents curious about rural life, with the former achieving an average completion rate of 65 percent along with engagement rates from 8 to 12 percent. Rural life documentation focuses on farmers' daily life, local traditions, and food preparation for them to emotionally connect to the content, causing engagement rates to escalate from 10 to 15 percent. Agribusiness marketing includes the use of commercial instruments such as livestream e-commerce and product demonstration videos on Tiktok, with highest tier promotional accounts often reaching over 10 percent conversion rates, while some middle and lower tiered accounts range between 3 to 7 percent. The analysis of the data and cases reveals the various content types possess a particular pattern regarding their spread effectiveness and economic profit-making potential, which when added together forms the multifaceted and unique agricultural short video social media ecosystem of Shaanxi. However, except for the "harvest season" or large-scale events, these short video creators rarely gather together and lack interaction with each other, which is not conducive to the further development of rural industries.

III. A. 3) User Engagement and Dissemination Effectiveness of Short Videos

The effectiveness of a video and its engagement level are two of the most important components that determine user communication success. It has been observed that Shaanxi agricultural short video creators have noticeable differences in follower growth, engagement according to the metrics, and the level of monetization achieved.

Among the various growth patterns, the "top tier" accounts stands out the most. An example includes "Paoshan Ah Hong", who has over 500,000 new follows in the last year alone and from that period, she is estimated to receive anywhere between 4 to 6% follower growth every month. This growth can be accredited to her consistent production of high quality content and interactivity during livestream e-commerce sessions. At the same time, many of the top creators and disseminators are new farmers who have new media operation knowledge and e-commerce management skills. They rely on their professional knowledge and skills to cooperate with the operation team to jointly create high-quality "Three Rural Issues" short videos. Though some small to medium accounts seem to be undergoing follower attrition. "Fan Xiang Jun Ge" for example, has been losing followers to the rate of 5 to 10% per month, which might be explained by the recommendation power of the platform as a result of content updates lacking in frequency and quality.

In the realm of engagement metrics, likes and comments have a direct impact on the secondary recommendations for videos and their dissemination effectiveness. Accounts in the upper stratum like "Paoshan Ah Hong" average over 100,000 likes on each of her videos, which garners up to 5,000 to 10,000 comments per video. Her average engagement volume over a 24 hour period is around 2-3% of her total followers which greatly aids in content dissemination. In comparison, mid-tier accounts chart lower in an engagement metric on average, an example would be "Shan Nan Shishi" who averages only 1,449.7 and "Xie Zongtao" whose videos average up to 35,324.2 likes, showing that content with more focused viral prospects can garner huge engagement rates for certain subjects. The data suggests that there is an increase in the engagement metrics in relation to the follower count, especially with regular posts and active feedback activities leading to enhanced exposure to the content.

When it comes to the level of account maturity, conversion capacity is an important indicator that serves to indicate a certain level of commercialization. Account monetization is always high with top-tier accounts due to commercialization with Tiktok's product showcase and livestream e-commerce. For instance, Paoshanahong utilizes a short video plus livestream model, achieving livestream sales per session of approximately 50000 to 75000 yuan, achieving commercial conversion rates of 60 to 70 percent. In contradiction, mid-tier accounts have not achieved effective commercial monetization, where Shan Nan Shishi and Xie Zongtao have total sales of 0. These accounts have low commercial conversion potential and require further research to find effective pathways for commercialization. This gap shows the account scale denial that exists with mid-tier accounts, but also, the benefits top-tier accounts receive in brand collaboration and market monetization.

As a whole, Shaanxi's agricultural short films have developed a clear interactive and dynamic ecosystem with high commercial prospects which is situated on the Tiktok platform. Through the operation models, top-tier accounts excel in follower growth, user engagement, and commercial conversion due to their exceptional content base and mature follower base. Mid-tier accounts, while slightly inferior in overall metrics, display unique advantages in specific niche markets and regional cultural dissemination. By further improving content quality and user interaction strategies along with trying out new business model, Shaanxi agricultural short video creators can help in the future in promoting rural revitalization along with digital economic development.

III. B. The live broadcast ecology of Shaanxi's rural short videos

Within the frame of the quickly advancing rural rejuvenation approaches and digital economy, livestream economincs has emerged as an important commercial model for agricultural short video dissemination within Shaanxi province. As a live streamer, one can host a variety of local agricultural products during the live streaming sessions, which allows working class individuals to purchase these items immediately. The following extracts will analyze in detail the central principles of the livestream e-commerce model focusing on the relevant data and case studies.

III. B. 1) Live streaming sales model

There is a strong positive relationship between the revenue generated from sales and the number of people who view the livestream. For instance, the well known Shaanxi agricultural short video marketer "Paoshan Ah Hong" earns an average of 489,000 yuan per session while her livestreams get around 1.084 million views daily. It is apparent from these figures that a larger view count leads to a higher intent to purchase, which translates to a higher conversion rate and sales revenue growth.

Traffic generated from recommendations on the platform is very important in the ecosystem of livestreaming. For instance, traffic from other parts of the platform makes up around 83% of the total viewer traffic for "Paoshan Ah Hong's" livestream sessions. This indicates that great content gets a huge amount of viewership with the help of algorithmic advertisement, leading to great traffic to livestream e-commerce and thus enhancing the overall commercial value of the livestream session.

Moreover, a unique positive relationship exists between follower count and e-commerce ability. The opinion leader theory in communication studies emphasizes the guiding role of individual characteristics in consumer behavior. Accounts that have a greater number of followers usually show better e-commerce activity due to greater user retention and trust. For example, as a top account, "Pao Shan Ah Hong" not only has a huge fan base, but can also exert influence on fans during live broadcasts. In particular, it uses the personal characteristics preferred by fans and plays the role of opinion leader to arouse brand recognition, which is why it performs particularly well in live sales. At the same time, accounts such as "Qiqi and Grandmother", which have medium follower bases, do not have as many followers as top tier accounts, but through effective product positioning and livestreaming, they achieve remarkable e-commerce conversion rates. This shows that in the livestream e-commerce model, content quality, interaction effectiveness, and user trust are as important as quantity of followers in determining sales conversion.

Lastly, for Shaanxi agriculture, rural areas and farmers short videos, their livestream ecosystem heavily relies on high viewer traffic and the platform's recommendation and achieves efficient commercial monetization through real-time interaction and precision marketing. In the future, further optimization of the livestream content and user interaction experience, and collaborative promotion with the platform will increase the number of accounts which can successfully adopt this model, bringing new life to rural revitalization and digital economic development.

III. B. 2) Live broadcast and short video linkage strategy

The strategy for integrating livestream and short video content seeks to maximize the promotion of short videos, as well as the livestreaming sessions, so that the account exposure and monetization chances increase. A couple of components account for this strategy: promoting traffic to the livestream sessions by creating and sharing

engaging short videos and aiding account growth through prompt editing and sharing of livestream videos as short videos. The following section analyzes the strategies with the use of cases and statistics.

With regards to "short video" to "livestream" traffic conversion, the short videos created and shared by content creators usually capture high emotional appeal as well as real value. For instance, "Paoshan Ah Hong" is known to pull a lot of potential consumers to her livestream sessions by previewing her livestream content, showcasing product features, and other people's positive reviews about the products in her short videos. On average, her livestream sessions are viewed about 1.084 million times daily, and her short video previews are received with roughly 25 percent higher than average click rates, both of which serve as solid quantifiable indicators that the sales can be expected from the livestream. Moreover, platform internal data shows that users' conversion rates within live sessions usually rise by 8-12% after the preview videos are uploaded, which further supports the claim about the positive impact of short video promotion on livestream sessions.

In contrast, the strategy of livestreaming followed by producing short videos shifts the focus towards reusing content for elevating account visibility by creating and repurposing short video clips captured during livestreams. As an example, when "Paoshan Ah Hong" livestreams, her staff edits important portions of the stream such as product introductions, audience participation, and flash sales, into short clips that can be quickly uploaded on Tiktok soon after the livestream ends. These short videos, referred to as feedback videos, are claimed to receive, on average, 30-40% of the views of the original livestream which is helpful in increasing the 'weight' of livestreams in the platform's recommendation algorithm. At the same time, user activity on these short videos in terms of likes, comments, and shares skyrockets and helps in increasing the brand's image as well as its follower base for the long term. Certain other medium-sized follower accounts, like, "Qiqi and Grandmother" adopt the same techniques, and while they have fewer followers than upper-tier accounts, these accounts have strong commercial value since their livestream ecommerce performance is much higher than these accounts due to better product promotion and efficient livestream sales tactics. These accounts are said to have 10-15% conversion rates during live streams which shows how powerful and effective their integration strategies are, especially with lower-tier accounts.

To summarize, the integration of live streaming with short videos improves audience engagement in real time as well as during the livestream sessions over time by short video preview traffic generation and livestream content redistribution. In the future, this model integration will benefit from stronger promotion across more accounts due to the continuously optimized platform algorithms and sharpened content operational strategies, pushing further the graduated use of Shaanxi agriculture short videos for rural rejuvenation and the digital economy's Shaanxi's agriculture's rural rejuvenation.

III. B. 3) Challenges facing the live streaming ecosystem

Even though the livestreaming e-commerce model holds great promise in Shaanxi's agricultural short video industry, to practically implement it poses two chief challenges: high reliance on traffic from recommendations and simplistic monetization strategies.

Due to the characteristics of agricultural products, agricultural product e-commerce has always been an industry with a low e-commerce penetration rate. The 2020 China E-commerce Report shows that the online shopping penetration rate of agricultural products is about 5%, which is much lower than the 20% penetration rate of the clothing industry and digital home appliances. Thus, in terms of traffic reliance, for most of the top-tier accounts, the majority of the viewer traffic comes from recommendation systems. For example, data shows that 83% of the viewer traffic in "Paoshan Ah Hong's" livestream sessions comes from platform recommendations during the streams, which indicates an overwhelming dependency on precision algorithm distribution. Unfortunately, this means that there could be drastic changes in account traffic and engagement rates due to changes in policies or recommendation features. Actually, data shows "Fan Xiang Jun Ge" has recently had a negative growth of followers (-8,258) which is in part evidence of a shift in platform algorithms, and the dangers that come with depending too much on traffic recommendations. The data also shows that for some top accounts, when platform recommendation traffic drops by 5-10%, their livestream sales drop by over 15%, which is a direct damage to brand stability and commercial conversion.

As for the monetization models, many accounts still depend mostly on livestream e-commerce for commercial monetization and alternative revenue models are still untouched. To illustrate, "Paoshanahong" accounts net earnings rely heavily on livestream e-commerce. While each livestream sells out 50,000 to 75,000 yuan, her singular monetization model creates economic volatility. At the same time, some mid-tier accounts like "Shan Nan Shishi" and "Xie Zongtao" have 1,248,926 and 839,332 followers respectively, but the provided data shows their total sales revenue is still at zero. That means those accounts did not establish advertising partnerships, offline promotions, or sponsorships yet. The platform data shows that accounts solely relying on livestream e-commerce

models usually have less than 30% commercialization rate, while diversified top tier accounts reach 60-70% commercial conversion rate.

To sum up, Shaanxi's agricultural short video live streaming ecosystem suffers from over reliance on platform recommendation traffic and passive monetization strategies. In the future, through achieving greater originality in content innovation, creators can combine advertising collaborations, brand integrations, cross-sector partnerships, and even offline activities, which helps distribute commercial risk while increasing overall account resilience as well as market competitiveness. This is also enable a deep entwine between rural regeneration and digital economy as it provides strategic operational optimization for platforms and creators.

IV. Discussion

IV. A. Content production strategy optimization

In the current age of digital communication, content strategy plays an important role in the circulation of short videos, and its application is particularly important in the agricultural industry of Shaanxi. As far as agricultural science communication, rural lifestyle documentation, and agricultural product advertising are concerned, enhanced content operation, increased user participation, and better production quality of the videos are the basic measures for improving the communication impact.

To begin with, effective content operation starts with the creator segmenting the target audience and developing strategies for each segment. Research shows that rural memory has an impact on the production and dissemination of content on short video platforms, and perceived emotional value is a driving factor that promotes short video users to continue to pay attention to the content. For instance, agricultural science popularization videos must have a strong emphasis on technical correctness and practicability; the data shows that videos of these types have average completion rates of 65% and average engagement rates of 8–12%. In contrast, rural lifestyle videos center more on emotional and authentic storytelling and are more likely to achieve engagement rates of 10-15%. For agricultural product promotion, effective presentation of many agricultural products' images can be achieved through product traceability, on-site production demonstration, and user feedback, yielding efficient commercial conversion through live-stream e-commerce. For instance, southern Shaanxi specialty agricultural products "Paoshan Ah Hong" leveraged short video teasers and elaborate product descriptions to boost conversion rates among live-stream viewers.

Interactivity enhancement is the second approach and it is a very important way to increase user content recommendation weighting. The recommendation systems of short video platforms depend on user comments, shares, and likes, and more active users have more chances of being recommended by the algorithm. The data shows that super accounts such as "Paoshan Ah Hong" have the total interaction volume of individual videos reaching 2-3% of the account follower number, which is very high and has greatly increased the secondary recommendation of the videos. Thus, creators need to increase user engagement by setting interactive topics, conducting question and answer sessions, and incentivizing comments, therefore achieving broader content reach across the platform.

Additionally, the adoption of qualitative methods of short video productions is also important. Effective visuals combined with great telling of the story improves user experience and the capturing of the audience's attention. Research shows that accounts with great production and narrative becomes costly to the marketing industry, as these accounts are perceived to have high rates of exposure on the platforms due to the word-of-mouth effects and user stickiness they cause. Video creators need to embrace better video shooting and editing processes that use high quality cameras and advanced post processing software to achieve sharp images with good composition; content creators also need to go beyond trying to capture content, and try to design plots and tell them to make the videos more appealing and to attract the attention of the audience. As a result, the short video accessible and captivating within a few seconds consequently leads to an increased average watch time which results to algorithms of the platform giving more weight to the recommendations.

To summarize, the optimization of the content strategy for Shaanxi agriculture, rural areas and farmers short videos must consider three core components: content management, user engagement, and production improvement. Creater's ability to optimize the effectiveness of dissemination through improving the deep stimulation of user interaction and the quality of video production will help achieve the dual objectives of commercial monetization and brand value enhancement. This strategic optimization is of great significance to the rural revitalization and digitization economic development of Shaanxi province as well as serves other regions for the agricultural short video communication.

IV. B. Platform operation strategy optimization

With the growing development of platform economy and the construction of digital villages, it is an inevitable trend that more and more villagers, especially young villagers, in rural society are participating in short video creation and live broadcasting. This is a positive exploration of farmers' digital transformation and social mobility, which needs attention and support. To decrease reliance on a single channel and further enhance the scope of distribution and effectiveness of commercial conversion, Shaanxi agricultural short video creators need to build multi-channel operational promotion systems. Primarily, the risk of overexposure can be mitigated, and overall brand exposure enhanced through simultaneous content distribution on Tiktok, Kuaishou, WeChat Channels and other platforms. According to some relevant statistics, multi-channel distribution can lead to an approximate 20 to 30 percent increase in the exposure a single piece of content gets, which is more than what accounts with an average user base are likely to get. Secondly, the timing and frequency with which content is published is another platform management tactic that should be optimized. Users' activity trends among followers are a big factor that determines how creators can time content release and increase the chances of platform recommendation, which raises viewership. The best examples in practice of top-tier accounts, like 'Paoshan Ah Hong', converting pre-live stream short video announcements into real-time traffic for livestreams through timed publication strategies. Ecosystem wide synchronized multi platform promotion coupled with precision based publication timing adjustment boosts total video exposure while improving user experience. Monetizing users becomes seamlessly achievable with this strategy in place.

IV. C. Live streaming sales strategy

As a primary model, the effectiveness of digital marketing strategies can be illustrated by the case of livestream e-commerce, where content integration, livestream quality, and model monetization drive success. First, enhancing the relationship between short videos and livestreams is one of the most effective ways to increase livestream reservations. Creators can encourage users to pre-book livestreams through engaging short videos. Statistics show that livestream reservations increase by 25% on average after engaging videos are released, resulting in streams of good quality traffic into these sessions. Second, improving livestream content quality is also imperative. Enhancing livestream scripts, planning interactions, and user-controlled feedback loops can significantly improve audience retention, and therefore e-commerce conversion rates. The role of marketers with their own characteristics is multiplied by the catalysis of social platforms, directly affecting network groups in multiple vertical fields. For instance, "Paoshan Ah Hong" does almost 489,000 yuan sales per her stream session due to her well-crafted product presentations and vigorous interactiveness during her streams. Finally, the exploration of engineered monetization strategies lies at the heart of livestream e-commerce specialization tactics. Apart from selling during the livestream, these creators should look out for opportunities to make commercial collaborations through brand promotions, subscriptions, and even offline advertising in order to reduce risk while optimizing revenue.

Account's adopting diverse monetization strategies can improve their overall commercialization ratio by around 20-30%. In summary, via an integrated strategy with short video traffic generation, livestream content optimization, and diversified monetization, Shaanxi agricultural short video creators can further improve the commercial conversion and market competitiveness of their livestream e-commerce businesses.

V. Conclusion And Outlook

Relying on the search data of Tiktok accounts and their livestream metrics, this research gives a thorough assessment of the communication ecosystem and the current condition of livestream e-commerce for agriculture, rural areas and farmers short videos in Shaanxi province, offering the corresponding strategy optimization suggestions. The research yields the following primary conclusions:

To start, within the communication ecosystem of agriculture, rural areas and farmers short videos in Shaanxi, upper level accounts have an unparalled impact. Take for instance, "Paoshan Ah Hong" who has more than 2.1 million followers and an average of 668,280 likes per video. She is the highlight of the agricultural world in so many ways with her overwhelming commercial conversion and content delivery rate. Simultaneously, her average daily viewership as per the livestream data is 1.084 million and her average earnings per session is around 489,000 yuan. However, high-tier accounts traffic rely mostly on platform recommendation systems, for instance, "Paoshan Ah Hong" has 83% of her viewers coming from platform recommendations. This form of traffic acquisition creates a daunting algorithm dependency for traffic. Besides, some small and medium-sized accounts "Fan Xiang Jun Ge" reported stagnated or declining follower numbers owing to low content update frequency and insufficient innovative activities.

Now, on the state of livestream e-commerce, accounts of significant followers have high conversion rates due to good user retention and brand goodwill. However, some accounts of modest followers such as "Qiqi and Grandmother" are noted to have high sales conversion with lower follower count owing to effective product placement and reasonable engagement. This signifies that the effectiveness of livestream e-commerce is impacted by the follower count as well as the content, user engagement, and employing strategies of livestreaming. In addressing the identified gaps, the following simplification suggestions were made: Improving content quality through enhanced content manipulation, more refined video shooting and editing to enhance the video's attractiveness and recommendation chances; Increasing the integration of short videos and livestreams by turning highlights into engaging short videos for editing and reposting after the livestreams to boost livestream bookings and conversions; Looking into other commercial monetization avenues apart from the livestream e-commerce such as actively sponsoring brand deals, adverts, and selling membership tickets and offline advertising to mitigate commercial risk and improve overall profits.

Shaanxi's agriculture short video and livestreaming e-commerce industries hold great promise. As creators strive to come up with refreshing operational techniques, platform recommendation systems tend to change and user needs become more complicated. Future study and implementation can break down into several lines: Content production and audience engagement— how to improve user retention and the effectiveness of platform recommendations via narrative and interaction design while ensuring the bona fide content to enhance dissemination effectiveness; Multi-platform collaborative operation— how effective cross Tiktok, Kuaishou, We Chat Channels and other platforms dissemination strategies work to allocate traffic risk and achieve complement brand effects and synergistic enhancement.; Diversified commercial monetization— providing agriculture short video creation professionals with conceptual assistance and pragmatic direction supporting them provides multiple income sources such as advertising, membership and even offline events; Platform algorithms and content optimization— how to escape traffic bottleneck while keeping the adherence to algorithmic rules, which results in high dependency on platform traffic.

This study delivers systematic analysis and optimization solutions for the agricultural short video communication ecosystem within Shaanxi province, and in addition to that, it demonstrates new pathways for further studies. In line with the development of rural revitalization strategies and the digital economy, the agriculture, rural areas and farmers short videos along with the livestream ecommerce models from Shaanxi seem to be more capable of realizing deeper transformative breakthroughs which would enable them to contribute towards the sustainable development of the rural economy and culture.

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