Research on Artificial Intelligence Empowering Agricultural Product Brand Construction in Baise City

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Abstract: To solve problems such as "high quality but low price" of characteristic agricultural products like Baise mangoes, this paper explores innovative paths for artificial intelligence to empower brand construction. Using literature research and field investigation methods, the article compares advanced domestic cases and deeply analyzes the current situation of agricultural product brand construction in Baise. The study finds problems such as lagging data development, lack of intelligent brand expression, shortage of composite talents, and weak consumer-end services. It is suggested to build a unified data system, develop digital twin experiences, cultivate composite talents, and strengthen intelligent services to realize the transformation from product output to brand value output.

Keywords: Artificial Intelligence; Agricultural Products; Brand Construction; Industrial Chain; Baise City

1. Introduction

Currently, artificial intelligence technology has become an important engine driving agricultural modernization and branding [1]. Located in western Guangxi, Baise City has a unique geographical environment and rich characteristic agricultural product resources. Geographical indication products such as Baise mangoes, Xilin shatang mandarins, and Xilin huojiang (ginger) are renowned inside and outside the region. However, in terms of brand construction, Baise City still faces challenges such as shallow excavation of brand value and market competitiveness needing enhancement. Compared with the brand construction of Xinyi honey peaches and West Lake Longjing tea, Baise City has gaps in AI technology application, brand visual innovation, and experiential marketing [2]. By breaking through the space-time limitations of traditional brand construction, artificial intelligence technology can utilize data resources and intelligent algorithms to build a new empowerment mechanism for agricultural product brand value [3]. In the era of the digital economy, how to draw on advanced domestic experience to build a new model of agricultural product brand construction driven by artificial intelligence, such as the four-dimensional empowerment model of Xinyi honey peaches - "precise positioning - personalized recommendation - visual innovation - experiential marketing" - has become an important issue that Baise City must face in its agricultural transformation and upgrading.

2. Current Status of Agricultural Product Brand Development in Baise City

The development of agricultural product brands in Baise City presents a complex picture where traditional advantages and emerging drivers intertwine. As a major agricultural city in Guangxi, Baise City has formed a characteristic agricultural product system dominated by mangoes, shatang mandarins, and tea by relying on its unique geographical and climatic conditions and profound farming culture heritage.

In terms of brand construction, Baise City has achieved remarkable results. As of the end of 2024, the planting area of Baise mangoes reached 1.25 million mu, forming an industrial pattern of early, mid, and late-maturing varieties. The marketing period lasts from early June to late August, with an annual output of 1.21 million tons. The comprehensive output value of the whole industrial chain exceeded 21 billion yuan, directly driving over 150,000 farmers to participate in industrial development and benefiting 400,000 people [4]. In 2025, the brand value of Baise mangoes exceeded 11.135 billion yuan, ranking among the "2025 Top 100 Landmark Brands of Chinese Agriculture" and simultaneously winning the "2025 Chinese Agricultural Business Card · Outstanding Contribution Award" [5]. The Xilin County

demonstration area was approved as a national geographical indication protection demonstration area, and the output value of four landmark products, including Xilin shatang mandarins, Ma ducks, Jiangjing, and Huojiang, increased by an average of 168.9% compared to before the preparation [4].

In terms of digital construction, Baise City actively promotes the quality and safety traceability management of mangoes. The upcoming mango quality traceability system will allow consumers to scan QR codes to view all-link information such as planting, fertilization, processing, and logistics. Currently, the city has completed basic data collection for over a thousand growers [5]. At the same time, the "Baixiang Baise" regional public brand has authorized 103 enterprises, covering 460 product categories, and built 20 core planting and breeding bases, forming a full-chain guarantee system from the fields to consumer terminals [6,7].

However, the brand influence of Baise City's agricultural products still does not fully match its status as a major agricultural city. In response to the varying production methods of thousands of fruit farmers and the difficulty in stabilizing quality, Baise implemented the "Six Unifications" model (unified brand, seedlings, acquisition, processing, packaging, and sales), and established core demonstration bases through the "agricultural technology department + leading enterprise + cooperative + fruit farmer" model, promoting the shift from "relying on experience" to "looking at data" scientific planting. How to grasp the changing needs of the new generation of consumer groups, transform historical and cultural heritage into brand competitive advantages, and achieve a leapfrog development from "selling products" to "selling brands" has become the core issue for future development.

3. Problems in Baise City's Agricultural Product Brand Construction from the Perspective of Artificial Intelligence

3.1 The Development and Utilization of Data Resources is Relatively Lagging

Although Baise City has begun to build a mango quality traceability system, the standardization degree of data resource collection needs to be improved. At present, the city has completed basic data collection for over a thousand growers [5], but "information silos" may exist between different systems. For example, environmental sensor data and market sales data have not yet achieved effective docking, which may lead to a disconnect between production decisions and market demands. This fragmented state of data restricts the application effectiveness of artificial intelligence technology in enhancing the brand value of agricultural products in Baise City.

3.2 Brand Image Shaping Lacks Intelligent Innovative Expression

In the communication of Baise City's agricultural product brands, traditional communication methods still dominate, and intelligent recommendation algorithms fail to effectively match the target consumer groups. Although the "Baixiang Baise" brand achieved good communication effects through the all-domain exhibition and sales network during the cultural and tourism conference [6,7], the application of immersive experience technologies such as virtual reality and augmented reality is still in its infancy. This superficial technology application makes it difficult for agricultural product brands to establish a cognitive advantage among young consumer groups. Compared with the "25-millisecond motion capture" and "force feedback technology simulating the 240°C green pot touch" of the West Lake Longjing tea's "Qingqing Yuncai" digital twin project, Baise City has an obvious gap in the application of somatosensory interaction technology.

3.3 The Shortage of Composite Talents Restricts the Development of Agricultural Product Brands

There are obvious barriers to talent flow between agricultural enterprises and technology companies, and there is a large gap in composite talents who understand both agriculture and artificial intelligence. According to the general situation in the agricultural field of Guangxi, the proportion of technical personnel with an interdisciplinary background is relatively low, which may cause technical solutions to deviate from actual agricultural needs. At the same time, the talent training system has not yet formed effective synergy, and there is a certain time lag between the major settings of universities and industrial needs. This lagging talent supply affects the implementation

efficiency of artificial intelligence technology in agricultural product brand construction.

3.4 There are Shortcomings in Intelligent Services on the Consumer End

At this stage, for agricultural product brand construction, the response accuracy of intelligent customer service systems in most enterprises needs to be improved, and the matching degree between products recommended by personalized recommendation algorithms and actual user needs is insufficient. With the continuous innovation and development of artificial intelligence technology, the coverage rate of Baise City's intelligent traceability system still needs to be increased, and the friendliness of the query interface has room for improvement. The roughness of these technology applications directly affects consumers' brand experience and trust.

4. The Significance of Artificial Intelligence to Baise City's Agricultural Product Brand Construction

4.1 Quality Control Dimension: Artificial Intelligence Can Establish a Quality Guarantee System Running through the Whole Production Process

In Baise mango plantations, the introduction of IoT devices can realize real-time monitoring of soil, lighting, and other data, guiding farmers to carry out unified water and fertilizer management and green prevention and control of pests and diseases [5]. Drawing on the practical experience of Lipu taro, artificial intelligence soil probes can transmit various soil nutrition data in real time every day, avoiding the high-cost problem of traditional methods that require extracting soil from the field for inspection [7,8]. Technologies such as hyperspectral imaging can accurately predict indicators like the sugar content and size of fruits before picking, ensuring the consistent quality of "Baise Mango" brand products. This transition from experience-driven to data-driven marks a shift in agricultural product quality control from result inspection to process control, significantly reducing the risk of quality fluctuation and realizing the intellectualization of agricultural product production.

4.2 Brand Value Dimension: Artificial Intelligence Can Reconstruct the Information Pathway between Agricultural Products and Consumers

In the context of the artificial intelligence era, deep learning algorithms can be used to analyze user behavior data on e-commerce platforms. By excavating unique resources such as the Baise Uprising red culture and Zhuang farming culture, and generating brand story texts with regional characteristics with the help of natural language processing technology, the cultural added value of Baise agricultural products can be significantly improved. For example, the "Baixiang Baise" brand packages intangible cultural heritage creative products such as Zhuang brocade notebooks and embroidered balls together with characteristic agricultural products into gift boxes, achieving brand communication through cross-boundary linkages [6,7]. In addition, the application of virtual reality technology can provide consumers with immersive shopping experiences, and this time-space-traveling brand narrative can greatly enhance the premium capability of products.

4.3 Market Response Dimension: Artificial Intelligence Can Build a Dynamically Optimized Brand Operation System

The application of intelligent recommendation algorithms on e-commerce platforms can adjust product combinations in real time according to users' geographical locations and consumption preferences, improving the associated purchase rate. At the same time, the social media monitoring system tracks brand public opinion through sentiment analysis. When negative reviews are detected, the system can automatically trigger the customer service response process to ensure that problems are handled promptly. For example, Baise City has implemented a "picking and marketing day" system, authoritatively publishing unified picking times for various varieties for many consecutive years, thereby guaranteeing the quality and reputation of marketed mangoes from the source [5]. This real-time perception and rapid response capability not only transforms brand crises into opportunities for improvement but also drives consumer satisfaction to rebound.

4.4 Brand Experience Dimension: The Combination of Artificial Intelligence and

Virtual Technology Can Reconstruct Consumption Scenarios

The deep integration of artificial intelligence and virtual technology can create immersive brand experiences for Baise agricultural products. As with the digital twin experience mentioned earlier, consumers can collect illustrations through virtual picking and cultural interaction to exchange for gift boxes, adoption rights, picking experience vouchers, or intangible cultural heritage creative products, enhancing user stickiness and repurchase intention. This experiential marketing combining virtuality and reality upgrades product output to a comprehensive value output of "quality + culture + experience," establishing a differentiated cognitive advantage among young consumer groups.

5. Optimization Paths for Baise City's Agricultural Product Brand Construction from the Perspective of Artificial Intelligence

Through systematic reform and innovation, Baise City is fully capable of achieving leapfrog development in agricultural product brand construction in the artificial intelligence era. The key to agricultural product brand construction lies in grasping the opportunities of technological changes, adhering to problem orientation, and building a coordinated development system supported by technological innovation, data-driven approaches, talent support, and policy guarantees.

5.1 Accelerate the Development and Utilization of Agricultural Product Digital Resources

During the construction process, Baise City's agricultural product brands need to formulate a unified agricultural data standard system for the whole city and promote data collection norms for the entire industrial chain of major agricultural products. For example, it can draw on Lipu City's experience in building a digital management AI information system, integrating IoT devices to construct professional algorithm models such as intelligent water and fertilizer integration and agricultural facility optimization [9,10]. At the same time, Baise City also needs to establish a municipal agricultural data middle platform, integrate data resources scattered across various departments, and build a full-chain data system covering production, processing, circulation, and consumption, thereby accelerating the development and utilization progress of agricultural product digital resources.

5.2 Improve the Intelligent Level of Brand Image Shaping

During the construction process, Baise City's agricultural product brands should establish an intelligent communication matrix based on user personas, integrating multi-dimensional data from e-commerce platforms, social media, and offline terminals to improve the intelligent level of brand image shaping. As with the digital twin experience mentioned earlier, combined with the mountainous planting characteristics of Lingyun white hair tea, a terraced virtual tea garden experience scenario can be constructed. The specific design includes: 1:1 replicating the core production area of Lingyun white hair tea; developing a "virtual picking - reality exchange" mechanism; introducing a "ten thousand people competing on the same screen" function, and holding Lingyun white hair tea picking PK competitions. At the same time, a coordinated mechanism of government guidance, enterprise subjects, and market operation should be formed. Drawing on the experience of the "Baixiang Baise" brand, brand influence can be expanded through cross-boundary linkage and all-domain layout [6,7]. To enhance the brand image of agricultural products, the intelligent level of brand image shaping must be continuously improved and achieved through multi-party collaboration and specific measures. Drawing on the "innovative brand visual model" path of Xinyi City's honey peaches, specific actions include: using conditional generative adversarial network technology (cGAN) to generate mango brand visual elements and generate designs based on brand positioning; using style transfer technology to integrate intangible cultural heritage elements such as Zhuang brocade and embroidered balls.

5.3 Build a Diversified Talent Training System Architecture

In the process of agricultural product brand construction in Baise City, interdisciplinary subjects of "Artificial Intelligence + Agriculture" should be established in agricultural colleges, implementing a "dual-mentor system" training model. At the same time, agricultural digital talent training bases can be constructed, adhering to the

concept of "continuous learning ability," establishing an "AI + Mango" online learning platform, developing a modular training course system, and organizing science and technology commissioners and "local experts" to go deep into the fields for technical guidance and paired assistance through forms such as the "Mango Classroom" [4], achieving the diversification of talent training. At the talent introduction level, talent incentive mechanisms should be continuously improved according to actual conditions. Special subsidies should be given to introduced composite technical talents, and corresponding welfare benefits should be provided, such as settling-in allowances, project funding, and inclusion in the Red City Talent Plan.

5.4 Strengthen the Intelligent Service Level on the Consumer End

In the process of agricultural product brand construction in Baise City, it is necessary to develop intelligent customer service systems specifically for agricultural products, integrate knowledge graphs and natural language processing technology, fully utilize "artificial intelligence data storage capabilities and user behavior analysis technology," and build consumer behavior databases; draw on blockchain technology to transform traceability information into digital collectibles to enhance consumers' emotional connections. For example, make full use of "Generative Adversarial Network (GAN)" technology to generate visual images of mangoes with different maturities for consumer education; draw on "gene-behavior coupling technology" to analyze user social data and accurately match Lingyun white hair tea culture enthusiasts. At the same time, promote agricultural product quality self-inspection terminals based on machine vision, guide consumers to obtain inspection reports in real time through mobile Apps, design a "quality inspection point" system where consumers can upload inspection reports to obtain points for corresponding rights and interests, etc. In the process of brand intelligent construction, attention should also be paid to the excavation of Baise's traditional craftsmanship and cultural value, such as Zhuang brocade, embroidered balls, and other intangible cultural heritage skills. Functions such as "VR Zhuang brocade making experience" and "AR embroidered ball interaction" should be developed, combining intangible cultural heritage experiences with agricultural product purchases to achieve industrialized development through branded operations [6,7]. This practice of deeply excavating cultural value can enable Baise agricultural product brands to gradually break away from simple price competition and shift toward the comprehensive value output of quality, culture, and experience.

5.5 Preliminary Conception of the Baise Model: The Four-Dimensional Synergistic AI Empowerment Brand Construction Model of "Data + Experience + Talent + Service"

The Baise model takes "data foundation, experience upgrade, talent support, and service improvement" as core elements, driving the transformation of agricultural product brands from "product output" to "brand value output" through four-dimensional synergy. This model emphasizes the organic integration and mutual empowerment of the four dimensions: data drives experience, experience accumulates data, talent guarantees operation, and realizes value, forming a closed-loop brand construction ecosystem. Its core lies in "adaptive innovation" based on local resource endowments, helping Baise City embark on a path of agricultural brand rise with regional characteristics.

First, the data foundation builds unified data collection standards, breaks through data barriers across the entire chain, realizes all-domain data perception, and provides precise support for production decisions. Through the "data feedback" mechanism, it promotes the transition from traditional planting to scientific planting.

Second, experience upgrade: relying on "AI + VR/AR" technology, a "digital twin + cultural immersion" experience space is constructed. Through digital twin orchards, cultural interactive deductions, and a "virtual achievement - reality equity" mechanism, an "experience - emotion - consumption" closed loop is formed.

Third, talent support: build a trinity talent system of "college training + practical training empowerment + flexible talent introduction." Through interdisciplinary training, modular courses, and flexible intelligence introduction, it solves the problem of a shortage of composite talents.

Fourth, service improvement: focusing on "intelligent customer service + personalized

recommendation + trust traceability" to improve the consumer-end service level. Through intelligent customer service, precise recommendations, and blockchain traceability, a trust system is built to enhance user stickiness.

6. Conclusion

In the agricultural transformation driven by artificial intelligence, Baise City is standing at a window of historical opportunity. When intelligent sensors are installed in the mango orchards of the Youjiang River Valley, when Baise mangoes accurately find customers through algorithms, and when the "Baixiang Baise" brand gains trust endorsement through blockchain, this is not only the transformation and upgrading of traditional industries by technology but also an important trajectory of a major agricultural city transforming into a strong agricultural city. When consumers "walk into" Baise mango orchards through VR equipment, "pick" virtual mangoes with their own hands, and exchange them for real gift boxes, this is not only the application of technology but also a revolution in the emotional connection between brands and consumers. This transformation is essentially reconstructing agricultural production relations: data becomes a new production factor, algorithms transform into brand value, and farmers transform into digital farmers. Drawing on the concept of "transformation from cognition to loyalty," digital transformation ultimately needs to realize the leap of consumers from "cognition" to "loyalty." In this process, the government, enterprises, and scientific research institutions need to form an innovative synergy, avoiding falling into the misunderstanding of "technological omnipotence" while also preventing path dependence by sticking to traditional models. Only by grasping the balance between technological innovation and industrial laws can the empowerment value of artificial intelligence truly be brought into play, allowing Baise City's agricultural product brands to radiate new vitality in the digital age.

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