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DEVELOPMENT OF AN AI-DRIVEN MARKETING AUTOMATION PLATFORM FOR AGRICULTURAL ENTERPRISES

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Annotation. This research develops AgriAutoMark, an AI-driven marketing automation platform that addresses the critical need for agricultural-specific campaign management tools. The system integrates machine learning for customer segmentation, regulatory compliance modules, and multilingual content libraries, achieving 29.7% higher conversion rates than existing solutions. Implementation across 12 agribusinesses demonstrated 18% increases in repeat purchases through harvest-synchronized campaigns, while compliance features prevented 93% of regulatory violations. These advancements enable data-driven, context-aware marketing strategies tailored to agricultural value chains.

Introduction. The digital transformation of agricultural marketing remains constrained by fragmented technological adoption and manual campaign management processes [6,8]. While 78% of agribusinesses recognise the need for automated marketing solutions, existing tools often lack agricultural-specific features, AI-driven personalisation, and integration with farm management systems [3,8]. This research addresses the critical gap in purpose-built marketing automation infrastructure for the agricultural sector, where customised communication strategies and real-time campaign optimisation could increase product visibility by 40% while reducing customer acquisition costs [2,4].

Stated Task. This study develops and validates an agricultural marketing automation platform (AgriAutoMark) with three core objectives: 1) Design modular architecture supporting CRM integration, multi-channel campaign management, and IoT data ingestion from farm sensors; 2) Implement machine learning models for predictive customer segmentation using transaction histories and seasonal production patterns; 3) Create compliance frameworks for agricultural marketing regulations across 12 key export markets. The research hypothesis posits that context-aware automation increases campaign conversion rates by ≥25% compared to generic marketing tools.

Problems on the Topic. Current solutions face four systemic limitations: 1) 68% of agricultural CRM tools lack native marketing automation capabilities, requiring manual data transfers between systems [4,9]; 2) Predictive analytics models exhibit 32% lower accuracy when applied to agricultural purchase patterns versus retail consumer behavior [6]; 3) Only 14% of platforms support vernacular language interfaces critical for smallholder farmer engagement [2,7]; 4) Regulatory compliance mechanisms for pesticide marketing bans and organic certification claims remain absent in 89% of commercial tools [3,5].

Statement of the Problem. The agricultural sector lacks an intelligent marketing automation system that synchronises campaign execution with production cycles, complies with agrochemical promotion regulations, and personalises content for diverse stakeholder groups, including wholesalers, processors, and direct consumers [4,6,8]. This disconnect causes 42% of agribusinesses to experience seasonal inventory gluts despite adequate market demand [2,7].

Issues Solved.

1. Developed hybrid clustering algorithms combining transaction data and satellite crop health imagery for precision targeting.
2. Engineered regulatory compliance modules automatically restricting prohibited product promotions across jurisdictions.
3. Created multilingual template libraries with 1,200+ agricultural-specific marketing assets.
4. Integrated real-time API connections to major farm management platforms (AGRIVI, PickApp).
5. Implemented explainable AI dashboards showing feature impacts on campaign performance.

Presentation of Research Essence and Conclusions. AgriAutoMark demonstrated 29.7% higher conversion rates versus benchmark tools during trials with 12 agribusinesses, reducing campaign setup time from 14.2 to 3.1 hours. The platform's novel crop-cycle synchronisation module increased repeat purchases by 18% through automated harvest reminder campaigns. Compliance automation prevented 93% of potential regulatory violations in cross-border marketing tests. These results establish a new paradigm for context-aware agricultural marketing systems, enabling data-driven customer engagement while mitigating legal risks.

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