Global Marketing and Optimization of Sustainable Food Products Utilizing Blockchain Technology

Dr. Marcus Nilsson[1], Dr. Mireille T. Ndaye[2]

[1,2]*Nordic School of Ethical Business, Sweden.*

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Abstract

Inferior food items are introduced to the market frequently. The excessive use of chemicals in manufacturing, the inclusion of unlicensed substances, and inadequate storage and ripening methods significantly affect the nutritional content of food products and customers' general health. There is a significant need for mechanisms to assess the quality of food items owing to the prevailing lack of openness in the existing process. Blockchain technology (BcT) is developing as a distributed and safe architecture that may eliminate the need for an outside entity to validate transactions inside the system. BcT, the foundational technology paired with tokens, can profoundly alter global marketing (GM) interaction by redefining the relationship between organizations and their consumers. This study presents Global Marketing and Optimization of Sustainable Food Products (GM&O-SFP) utilizing BcT. The effectiveness of SFP within an established company framework pertains to the optimization of component production elements utilized in the manufacturing process, aimed at reducing variable costs—such as the volume of water, fertilizers adjusted to changes in the seasons, and chemicals employed—which subsequently impacts the pricing framework of production and yields favorable effects on the entrepreneur's gross revenue. BcT encompasses many complex and rapidly advancing technological and structural elements, making it difficult to understand and integrate them into established GM frameworks, methodologies, and theories. Conversely, focused attention on tokens facilitates understanding and classification. This article delineates terminology pertinent to the evolving token landscape from the perspective of GM, illustrates the potential impact of tokens on the GM sector, and proposes strategies for their integration into SFP.

Keywords: Sustainability; Food products; Tokens, Blockchain; Global marketing; Entrepreneur; Optimization; Revenue.

I. OVERVIEW OF THE PAPER

This research examined the application of the BcT to the marketing of SFP to verify the provenance and quality of food products. Consumers are dissatisfied with the standard of farm products they consume due to using artificial chemicals for agriculture (González-Puetate et al., 2022). The manufacturing of SFP sufficiently meets market demand; therefore, a product accreditation method is necessary. Consequently, the market for SFP and health-certified goods is rising owing to prevailing worldwide health concerns. Customers hesitate to trust current licensing methods due to their lack of openness (Bonetti et al., 2024). This effort aimed to develop an accountable and optimized architecture for food accreditation by integrating a reliable

verification system that uses BcT and other innovations. This article presents a created and proven demonstration of the concept.

The significant environmental contamination caused by agricultural pesticides and their impact on human wellness has led to a growing market for organic goods. The increase in worldwide interest and new markets, elevated prices in regional and export markets, and a 35-105% rise in agriculture revenue motivate farmers to participate in the SFP. The agribusiness supply chain differs for each commodity (Parameswaran et al., 2024). Every product or crop has a distinct trajectory during the process. Value-adding or creation activities may occur inside the supply chain. Significant waste, destruction, and inability to verify provenance may occur when items reach the consumer's destination (Saurabh & Dey, 2021).

The introduction of Bitcoin as the initial electronic currency and BcT addressed the need for an authorized entity or centralized server to prevent duplicate cash spending. The BcT has since extended beyond its first use as a means of payment in Bitcoin (Camel et al., 2024). The advent of the subsequent generations in BcT applications has extended into other domains. The GM of SFP is a critical domain where BcT is extensively used. Maersk, the preeminent global container carrier, evaluated the implementation of BcT in global logistics to save documentation in transportation and cargo monitoring.

Current supply networks encounter dependability difficulties such as customer confidence, openness in the supply chain, quality of products, logistical challenges, ecological impact, private customer information, security, fraud, and food safety. Customers need more openness and information, but existing systems cannot deliver such information (Chandan et al., 2023)-(Panghal et al., 2024). In most instances, details are verified by external entities, and documents are maintained in physical form or centrally located databases.

II. MATERIALS AND METHODS

Beginning with the farmer or agriculturalist and working via the consumer, Fig. 1 offers a linear and slightly fractured picture of food distribution. The chain comprises various middlemen, including regional marketplaces, suppliers or mediators, exporters, and major outlets like hotels or supermarkets. Low-quality excess in this flow is focused on regional markets, sometimes leading to unequal quality control and price inconsistencies. By focusing premium-grade goods toward GM channels, the exporter significantly helps to connect local supply to worldwide markets through SFP methods.

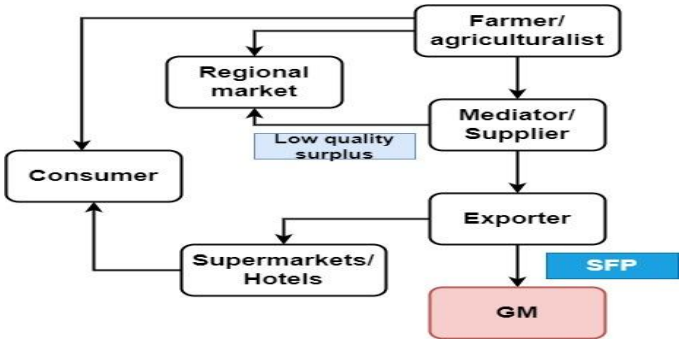

Figure 1: Conventional Supply Chain Management of SFP with GM

However, this traditional approach has certain inefficiencies and compromises to sustainability. Multiple middlemen might lower traceability and raise prices, therefore affecting the transparency and ethical sourcing needed in systems of SFP. Moreover, diverting lower-quality excess to regional markets while high-quality items go to worldwide markets might widen the food availability and quality disparity between local and international customers. This emphasizes the importance of reorganizing supply chains to be more vertically integrated and data-driven, thereby preserving sustainability, justice, and food safety throughout the value chain—from farm to plate.

2.1 Global Marketing and Optimization of Sustainable Food Products (GM&O-SFP) utilizing BcT

BcT is a technology revolutionizing how companies and people exchange and keep data digitally. It signifies an advancement in the evolution of the Internet from the information economy (C1), which enabled one-way interaction, to the digital market (C2), which allowed two-way interaction and fostered the emergence of e-commerce and networking sites via specialized intermediaries, culminating in the Token marketplace (C3), which facilitates peer-to-peer transactions and electronic contractual agreements in GM&O-SFP. Consequently, W3 may provide transformational economic and commercial potential for GM&O-SFP comparable to its predecessors. Fig. 2 shows the Global Marketing and Optimization of Sustainable Food Products (GM&O-SFP) utilizing BcT.

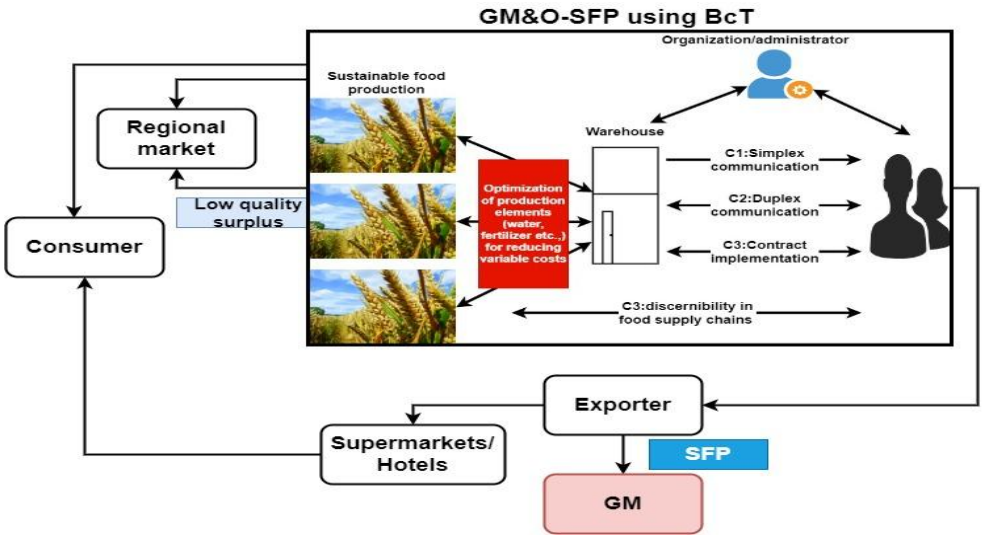

Figure 2: Global Marketing and Optimization of Sustainable Food Products (GM&O-SFP) Utilizing BcT

Fig. 2 offers a detailed overview of the essential alterations that the widespread use of BcT may induce in the conventional framework (depicted in Figure 1). The World Wide Web (WWW) evolved as an electronic platform for focused, straightforward communication via C1. C2 ultimately developed into bidirectional interaction, as shown by the bidirectional arrow. Moreover, the BcT-based Web 3 (C3) now facilitates contract execution and the immediate value transfer between sustainable food producers and consumers, potentially eliminating the need for a supplier/mediator (shown by the organization/administrator in Fig. 2). By enabling

collaborative information interchange, it may enhance information integrity for both consumers and enterprises along the entire value chain. The efficacy of SFP within a corporate structure relates to the optimization of production components in the manufacturing process, intended to minimize variable costs—such as water usage, seasonally adjusted fertilizers, and employed chemicals—which subsequently influences the pricing structure of production and positively affects the entrepreneur's gross revenue.

GM&O-SFP research, rooted in extensive practices, employs several structures and models, mostly based on intricate cognitive and psychological concepts. The fundamental assumptions of GM&O-SFP may not be much altered by blockchain, akin to the first emergence of the World Wide Web. It is essential for academics, professionals, and researchers in GM&O-SFP to meticulously evaluate how to integrate this continuing transition into their investments in approaches, procedures, and ideas. Companies must ascertain if their SFP and service offerings, including advertising and content development for social media platforms alongside manufacturing and distribution, are positioned to capitalize on the prospects presented by the Token market. For example, they may formulate innovative business strategies centered on decentralization to provide clients with comprehensive insights into their SFP supply chain. Tokens can initiate transparent, organization-wide loyalty programs and novel initiatives for SFP production. Tokenization may fundamentally alter essential GM&O-SFP concepts such as perceived safety, secrecy, loyalty, and trustworthiness. Businesses may capitalize on this change by presenting their services to clients in a distinctive manner.

III. CONCLUSION

This work introduces Global Marketing and Optimization of Sustainable Food Products (GM&O-SFP) using BcT. The efficacy of SFP within a corporate structure relates to optimizing production components in the manufacturing process to minimize variable costs—such as water usage, seasonally adjusted fertilizers, and employed chemicals—which subsequently influences the pricing structure of production and positively affects the entrepreneur's gross revenue. BcT comprises several intricate and swiftly evolving technical components, making comprehending and incorporating them into existing GM frameworks, techniques, and ideas challenging. The BcT-based Web 3 (C3) now facilitates contract execution and the immediate value transfer between sustainable food producers and consumers, potentially eliminating the need for a supplier/mediator. This article defines terms relevant to the changing token environment from GM's viewpoint, examines the possible effects of tokens on the GM sector, and suggests ways for their incorporation into SFP.

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