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Developing a Precision-Based E-Marketing Application for Improved Adoption Among Traditional Farmers in the Eastern Cape, South Africa

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ABSTRACT

In this study, the authors aimed to create a region-specific e-marketing application tailored to farmers' and customers' satisfaction based on a technology acceptance model guided by service-dominant logic entwined with design science research methodology. They adopted exploratory research involving interviewing 104 and 42 farmers and users for a pre-installation and post-installation investigation in Alice, Eastern Cape, South Africa. The investigation showed that 86.5% of the population is educated with at least a school matric certificate, which is enormously correlated with farmers' willingness to adopt e-marketing apps ($R^2 = 0.782$). The adequacy of the post-installation evaluation is confirmed by the Kaiser-Meyer-Olkin measure (0.753) under the principal axis factoring, which also reported ease of data update, editing, ease of usage, and the overall impression of the app as the four principal factors that favor the app adoption. Inferentially, the e-marketing apps effectively connected farmers with buyers, providing an efficient virtual market solution.

KEYWORDS

Programming Language, Technology Acceptance Model, Android, Kotlin, South Africa

INTRODUCTION

Communal farmers are crucial in ensuring global food security; they represent more than 70% of the impoverished and vulnerable rural population in developing nations, particularly in sub-Saharan Africa (Food and Agriculture Organization of the United Nations, 2015; Thothela et al., 2021). However, they encounter numerous challenges in accessing essential information, advisory services,

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and viable markets. Consequently, they remain susceptible to extreme weather conditions, pests, diseases, and post-harvest losses, all hindering their agricultural productivity (Mapiye et al., 2018; Masuka et al., 2016; Mpandeli & Maponya, 2014; Nicholas-Ere, 2017). Traditional marketing methods, such as one-on-one conversations, phone calls, and short message service, are time-consuming and labor-intensive (Masuka et al., 2016). Moreover, these methods are inefficient because limited access to radios and televisions makes them costly and risky for perishable products. Therefore, establishing a more efficient channel for disseminating information is necessary (Baumhardt et al., 2013; El Bilali et al., 2019).

The exponential growth in mobile phone use presents a promising solution for marketing agricultural products (Fosu & van Greunen, 2020). Information and communication technology (ICT) can bridge communication gaps, provide real-time market updates, facilitate business transactions, and engage stakeholders (Fosu & van Greunen, 2020). Although commercial farmers benefit from existing e-commerce infrastructure, communal farmers often lack the necessary resources (Ma et al., 2023; Thothela et al., 2021; World Bank Group, 2019; Yuan et al., 2021). Hence, in this study we aim to optimize e-marketing opportunities through mobile phone e-marketing application development to minimize post-harvest wastage among communal farmers.

LITERATURE REVIEW

Traditional farming relies on indigenous farming knowledge, innovations, and crude implements passed down through generations (Hamadani et al., 2021). It is considered the most sustainable farming system because it balances natural resources, ecosystems, and land management (Alam et al., 2014). Traditional farming involves integrated livestock farming, intercropping, crop rotation, and natural farming methods, such as agroforestry, composting, and recycling (Singh & Singh, 2017). It is typically rain-fed and prevalent in rural communities, serving as the agricultural hub and economic backbone (Bartol, 2023; van Schalkwyk et al., 2016). Different forms of farming that have evolved from traditional farming include peasant, communal, small-scale, resource-poor, food-deficit, subsistence, and emerging farming (Bartol, 2023; van Schalkwyk et al., 2016). Enhancing the well-being of traditional farmers, including their farming efficiency, income, and productivity, is a crucial aspect of the United Nations' sustainable development goals (Ma et al., 2023). This plan includes initiatives to improve access to healthcare (goal 3), foster innovation for income and employment generation (goal 9), and foster global partnerships for sustainable development (goal 17; Andersson & Hatakka, 2023; Ma et al., 2023). One innovative approach to achieve these goals is by improving marketing efforts through electronic (e-marketing) platforms supported by e-commerce infrastructure, considering the widespread use of smartphones.

E-marketing, also known as digital marketing, refers to using electronic data and ICT software to develop, distribute, and enhance the marketing of products, services, information, and ideas (El-Gohary, 2010). E-marketing improves marketing strategy by focusing on the four Cs of marketing: customer solution (product), cost (price), convenience (distribution place), and communication (promotion) (Anadozie et al., 2021; El-Gohary, 2010). E-marketing offers several benefits, such as enhancing the marketing network and internationalization (Kaewprasert, 2019), improving market timeliness and continuity (Dwivedi et al., 2021), optimizing marketing dynamics and customer systemization (Tolstoy et al., 2022), and reducing market congestion and transportation logistics (Shao et al., 2016). By expanding the marketing network, e-marketing enables communal farmers to enhance their performance by reaching millions of potential customers through networking infrastructure. Numerous studies have recognized the significant potential of the mobile app marketplace in both developed and developing countries (Chhachhar et al., 2014; Hanselmann et al., 2023; Masuka et al., 2016). However, the adoption of e-market apps is still shallow in several rural communities despite the ubiquity of ICT infrastructure. While researchers are recognizing the problems of insufficient Internet connectivity, high cost of data access, cultural barriers, education levels, security risk, and