Chapter 3
Assessment of Open Innovation Practices Among Micro and Small Enterprises: An Analysis With Machine Learning and Regression

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ABSTRACT

This study explores open innovation practices among micro and small enterprises (MSEs) in Srikakulam through predictive analysis using machine learning and regression techniques. Key innovation drivers were identified using feature selection methods such as Information Gain, ANOVA, and Chi-square. Components like customer co-creation, digital platforms, and venture capital access emerged as significant predictors of innovation success. Regression analysis further validated their influence on business growth. The findings offer actionable insights for stakeholders to enhance innovation strategies, foster collaboration, and optimize resource allocation. This data-driven approach strengthens the understanding of innovation dynamics in the MSE sector.

1. INTRODUCTION

Open innovation represents a strategic shift from traditional, insular innovation models to more inclusive approaches that leverage both internal and external knowledge sources. This paradigm has gained substantial traction globally, particularly as businesses confront increasingly complex technological challenges and market uncertainties (Chesbrough, 2003). In India, micro and small enterprises (SMEs) which account for around 30% of GDP and 45% of exports (Ministry of MSME, 2023) stand to benefit significantly from open innovation (OI) due to their limited internal resources and capacity. However, the adoption of OI in rural and semi-urban contexts remains uneven and underexplored. In regions like Srikakulam in Andhra Pradesh, where SMEs are concentrated in agriculture, textiles, and small-scale manufacturing, traditional business practices continue to dominate, with minimal integration of contemporary innovation frameworks.

This disconnect between policy aspirations and ground realities is stark. While national initiatives such as “Digital India” and “Make in India” aim to foster innovation and digital transformation, the impact on rural SMEs has been limited (Singh & Gaur, 2022). The primary barriers include inadequate digital infrastructure, low awareness, financial constraints, and lack of technical expertise (Tawil et al., 2023). These challenges not only stifle innovation capacity but also widen the competitiveness gap between rural SMEs and their urban or larger counterparts. Studies on SMEs in other contexts have revealed that those which engage in simultaneous OI practices combining external collaborations with internal innovation are often more agile and competitive (van de Vrande et al., 2009). However, such models are rarely examined in the Indian rural enterprise context, creating a gap in both scholarship and practical guidanc

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